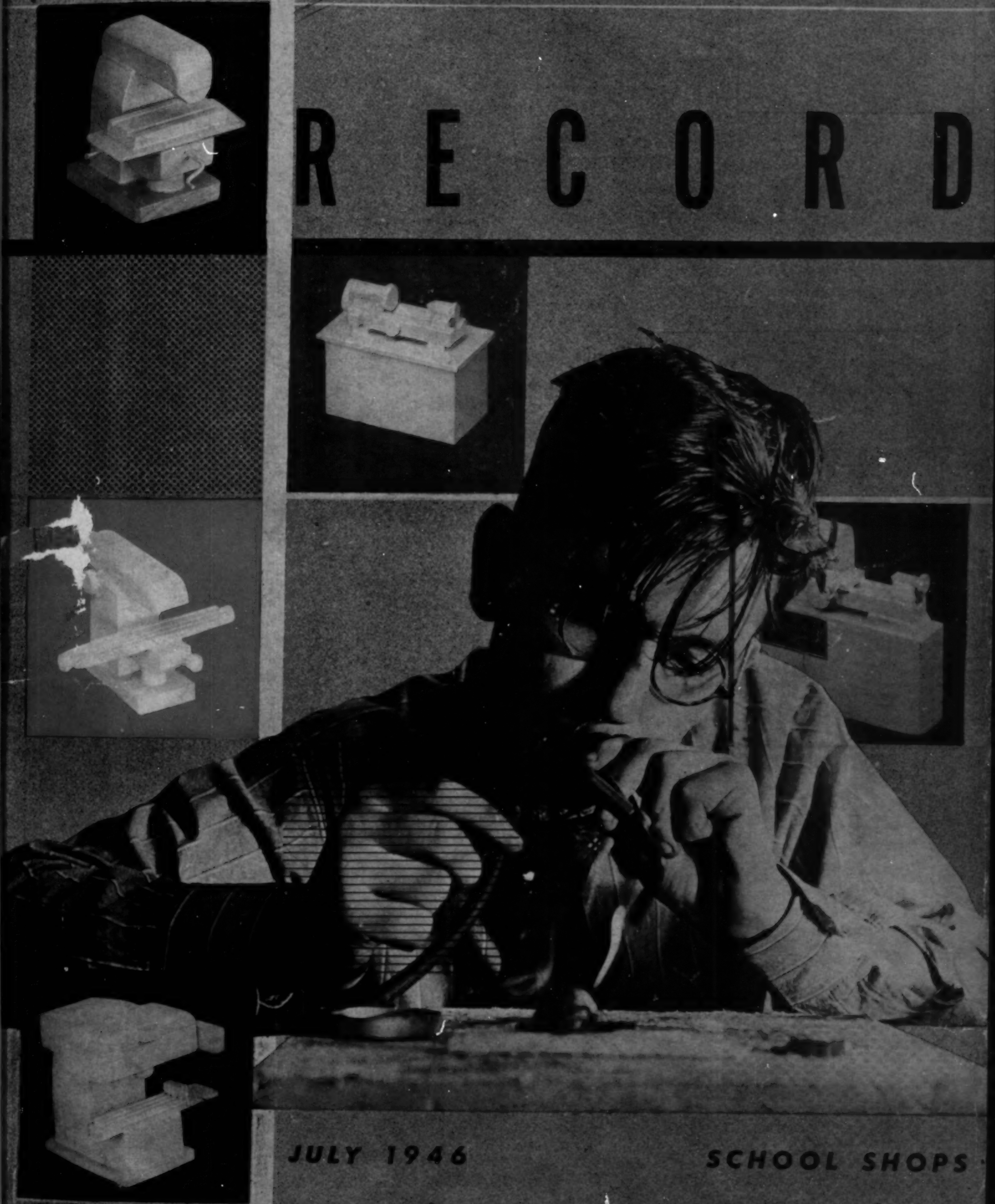
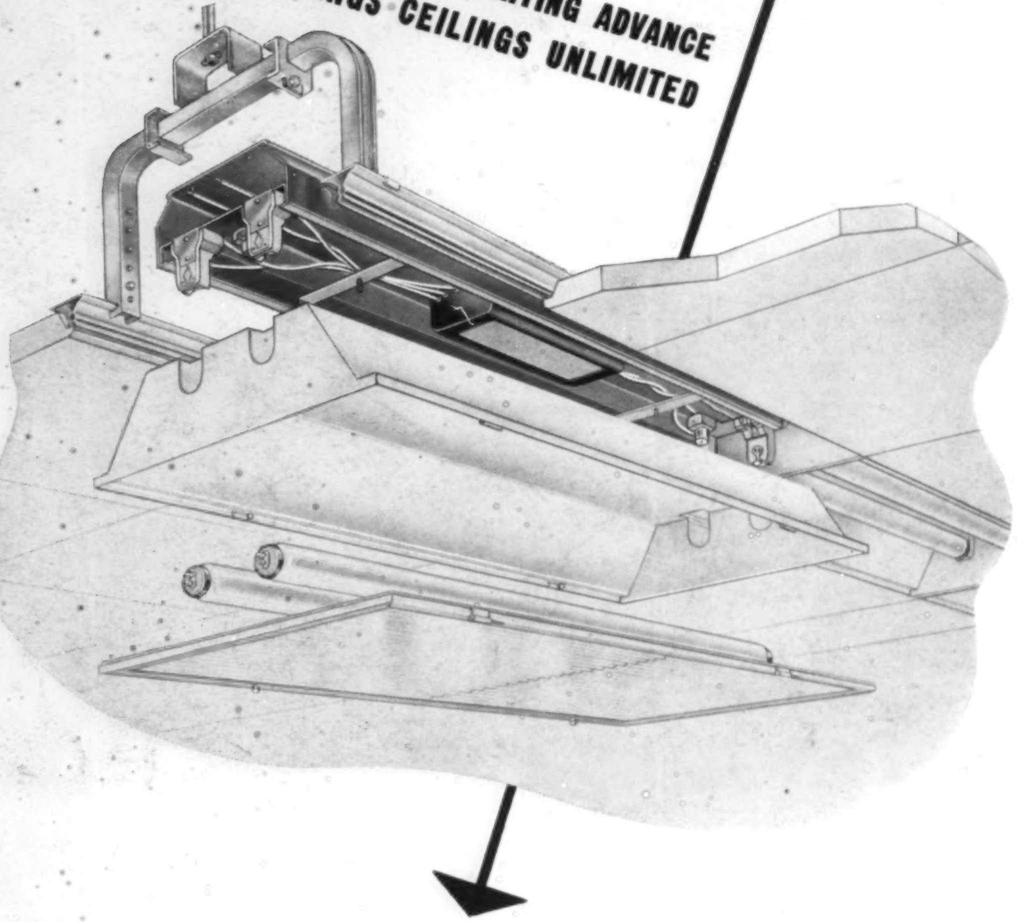
ARCHITECTURAL RECORD



JULY 1946

SCHOOL SHOPS

IMPORTANT LIGHTING ADVANCE BRINGS CEILINGS UNLIMITED



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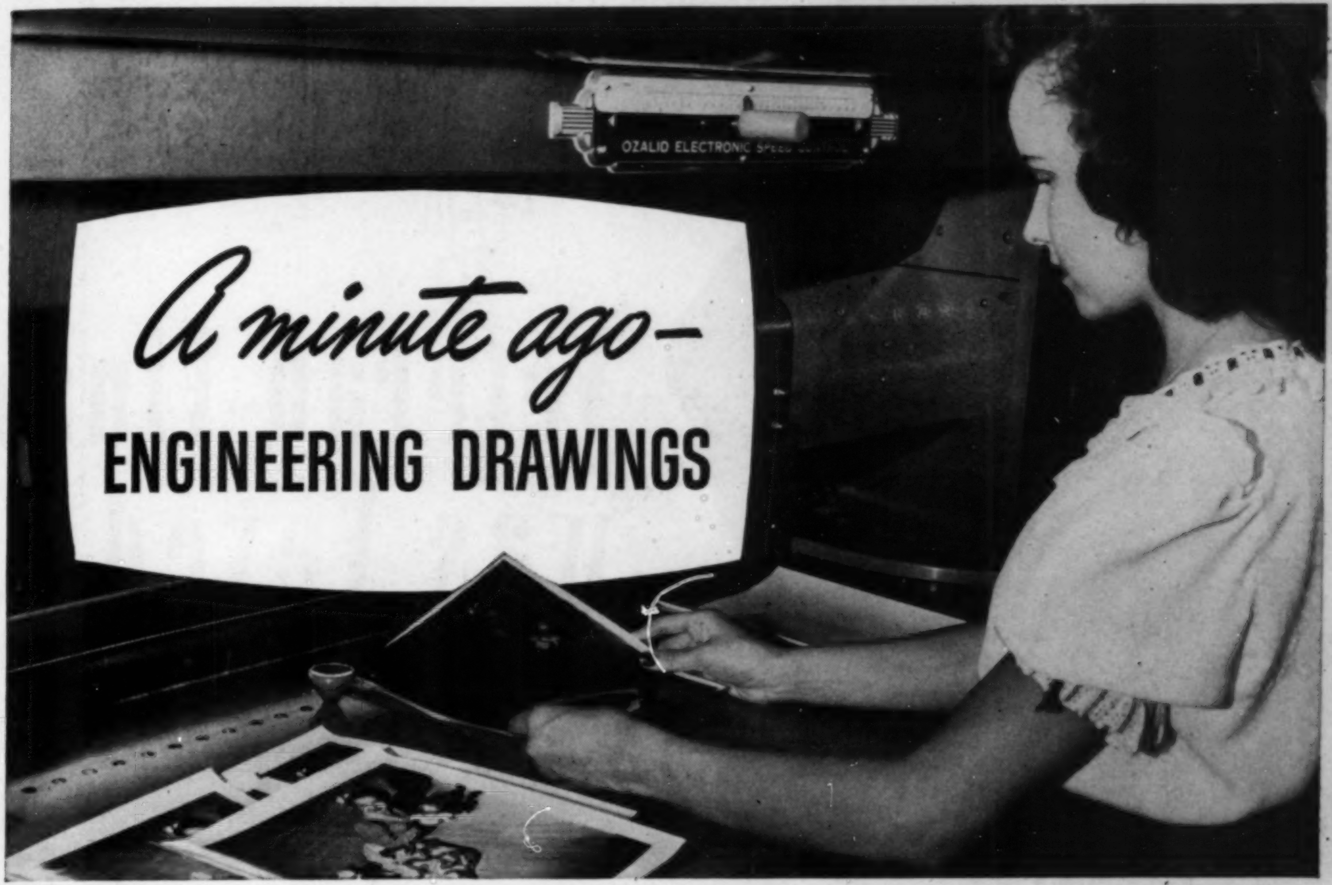
Arch. Lib
Wahl



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Veteran Vinson was Vexed . . .

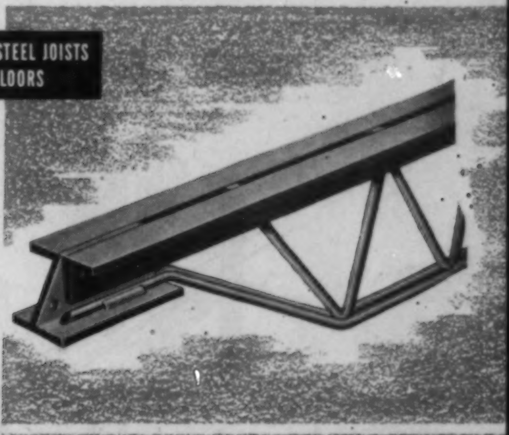
BUT NOT FOR LONG

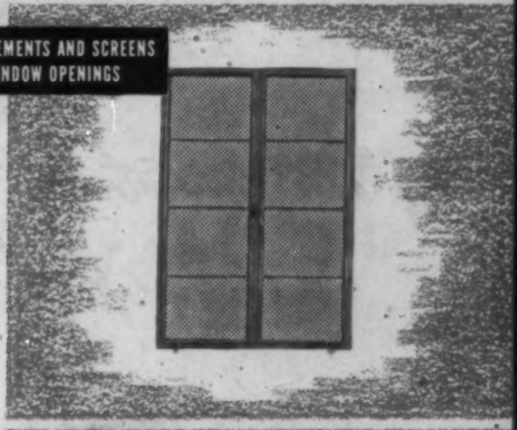
His Architect and Builder Turned to Ceco...and Construction on His Home Went Ahead

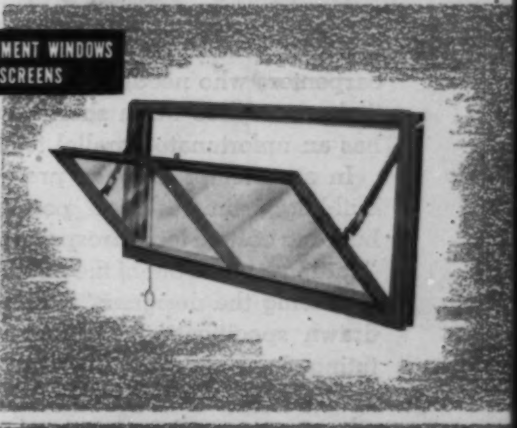
In a foxhole on Okinawa, Veteran Vinson made a promise to himself. When he got back he was going to build a home of his own . . . and he kept that promise. He watched the basement and foundation walls go in and then it happened. Previously specified materials suddenly were unavailable. Veteran Vinson was vexed—and still might be if the architect and builder had been less alert. They called on Ceco. New designs were drawn and available products substituted for those which could not be had. Veteran Vinson was happy again—not only was construction resumed but he obtained a better building.

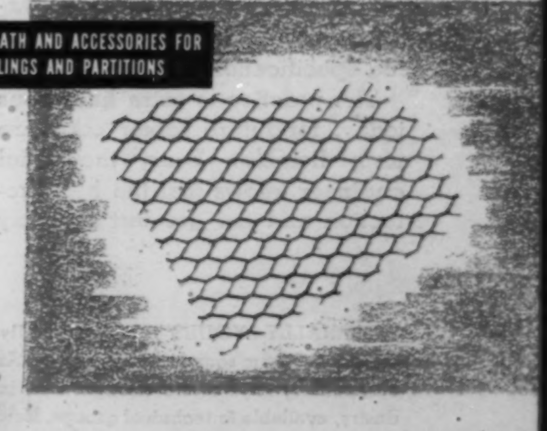
In construction products **CECO ENGINEERING**

HERE ARE THE CECO PRODUCTS THAT HELPED SOLVE VETERAN VINSON'S PROBLEM...


OPEN WEB STEEL JOISTS FOR FLOORS


METAL CASEMENTS AND SCREENS FOR WINDOW OPENINGS


METAL BASEMENT WINDOWS AND SCREENS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Ceco Engineers do more than design and manufacture fine construction products. Besides their wealth of technical engineering knowledge there is constantly available to you construction know-how gained by many years of experience on the job, in the field. In 23 offices strategically located from coast to coast, Ceco stands ready to help solve your problems without delay and with technical skill. In these days of shortages, Ceco often can show you how to adapt available products so the job can go ahead. In the matter of hard-to-get materials, Ceco is doing all it can to rush production for you.

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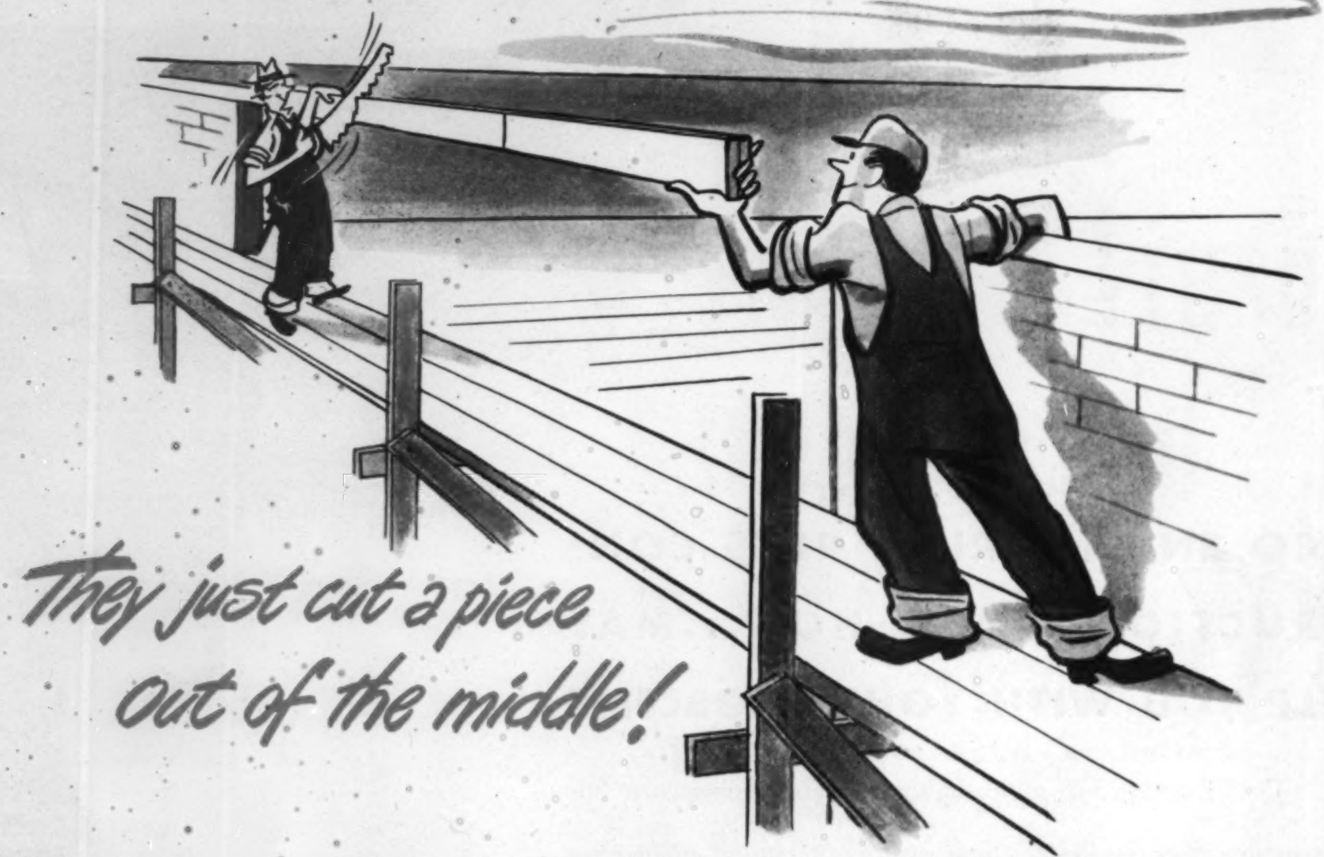
When the beam was too short...


They just cut a piece out of the middle!

The method used by the resourceful carpenters who needed a piece of timber to splice out a short beam has an unfortunate parallel today.

In an attempt to make pre-war building estimates span post-war building costs, a lot of prospects are "cutting a piece out of the middle" by slicing the designers' carefully drawn specifications, and substituting cheap materials. The starting point is all too often the place where compromises are most expensive in the long run—the piping specifications.

The practice is extra hazardous today, for future repair costs are unpredictable. Every thoughtful engineer knows that the best protection and the greatest economy come from the use of materials of proved durability.

Byers Wrought Iron pipe provides this durability, as reports from all over the country can testify. In surveys of old buildings made in a number of cities, wrought iron heating lines, water lines, vents and downspouts and similar building services were found still serving after periods up to 50 years, where low-first-cost materials had failed in a fraction of that time.

The Byers Engineering Service Department is always ready to help you in properly applying wrought iron, basing all recommendations on actual reports of service under identical or similar conditions. A number of the case histories that support engineering use of wrought iron are given in our bulletin, "Wrought Iron for Piping Systems," which will be sent on request.

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ARCHITECTURAL

RECORD

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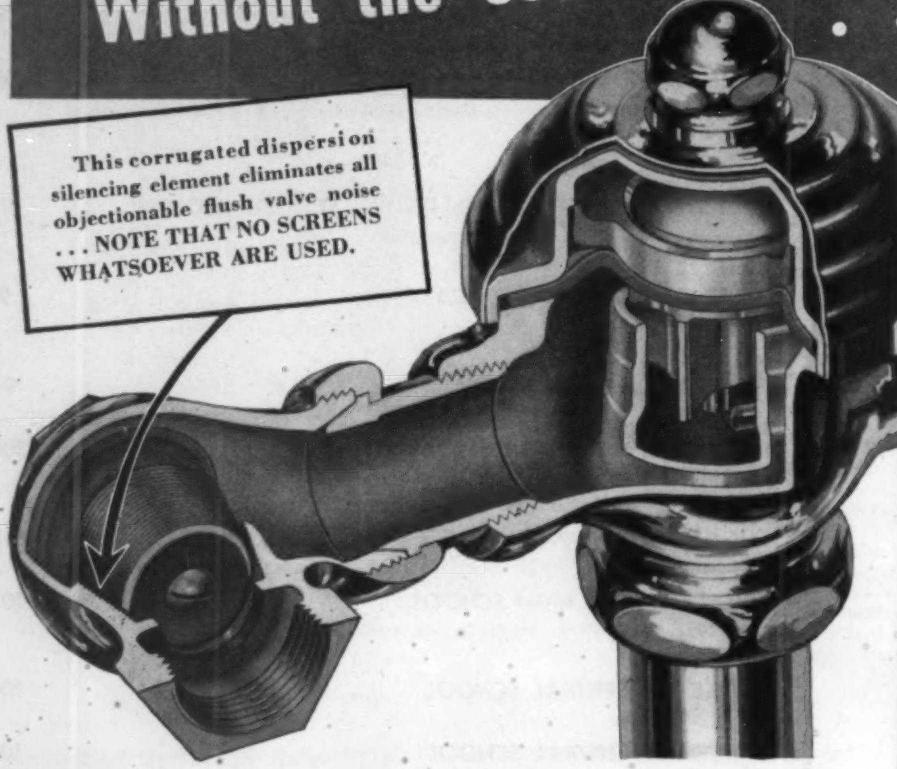
WATROUS *SILENT-ACTION* Eliminates Flush Valve Noise Without the Use of Screens . . .

. . . Another

of the many Watrous Points of Superiority

- **Water Saver Adjustment**
- **Self-Cleansing By-Pass**
- **Single-Step-Servicing**
- **Self-Tightening Handle Packing**
- ✓ **Screenless Silent-Action**
- **Sturdy Brass and Bronze Construction**



This corrugated dispersion silencing element eliminates all objectionable flush valve noise . . . NOTE THAT NO SCREENS WHATSOEVER ARE USED.

THE growing preference for silent-action in flush valves has resulted in the development of many methods of silencing. The difficulty with earlier methods, using some form of screen, shot, muffler, or similar elements which invariably become clogged, was that the flush valves either did not remain quiet—or the silencing elements had to be cleaned or replaced all too frequently.

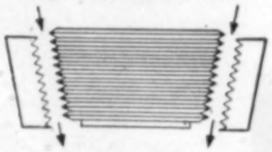
Recognizing these shortcomings, the manufacturers of Watrous Flush Valves developed a remarkably efficient dispersion silencing element which silences the flow of water through the use of a large number of corrugations, as described at right.

Watrous *Silent-Action* Flush Valves not only eliminate all objectionable flush valve noise but they assure silent operation that *STAYS* silent. These valves have no parts requiring frequent replacement, cleaning or adjustment.

Before you select flush valves for buildings where noise reduction is desirable, get complete information on Watrous *Silent-Action* Flush Valves.

Silencing Flush Valves

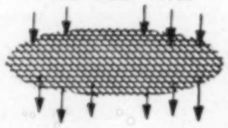
THE WATROUS WAY



The new method of silencing used in Watrous SILENT-ACTION Flush Valves is to pass the water between two surfaces having a large number of corrugations or roughened surfaces which act as "brakes" that silently arrest the surge of water to the valve and eliminate turbulence.

Note there is nothing in this unit which requires replacement and there is ample space for dirt and scale to pass through. As a result, silent operation stays silent and there is no need for frequent adjustment or renewal of parts.

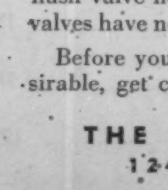
THE OLD WAY



The old method of silencing flush valves is to pass part or all of the water going to the valve through one or more screens. (Perforated discs or shot pellets also used). The trouble with this method—as the screen on your kitchen faucet will quickly show you—is that screens become clogged and must be cleaned or replaced at frequent intervals.

Also, clogging makes necessary frequent adjustment of the shut-off to keep the valve working properly.

THE IMPERIAL BRASS MFG. COMPANY
1240 W. Harrison St., Chicago 7, Ill.



For complete information on Watrous Flush Valves see Sweet's Catalog or write for Catalog No. 448-A. Also ask for Bulletin No. 477 giving a summary of "Architects' Views on Flush Valve Applications."

THEY PAY FOR THEMSELVES IN THE WATER THEY SAVE

Watrous Flush Valves

THE RECORD REPORTS

Building Permits Being Issued Fast • Premium Payments Form a New Tool for Increasing Production • FHA Offers Series of Small-Home Layouts

A mid-summer look at building activity from coast to coast leaves official Washington none too happy, even though occasional bright spots relieve the overhanging gloom. Unprecedented spurts in production could lift lagging programs to the ambitious goals set months ago but agency chiefs foresee no such miracles at present.

Strikes, particularly the coal strike, spotted supplies, black market trouble, slowness of Congress — these and other obstacles plaguing the first six months of the year lay an enormous burden on the last half if the hoped-for number of houses is to materialize by Christmas.

Construction Mounts

Yet, despite reconversion handicaps, construction is moving ahead by leaps and bounds, government men are quick to say. As June rolled in, building permits were being issued almost as fast as in the record-breaking mid-Twenties, they advise, and add that the first four months of the year saw an estimated 315,000 dwelling units started, 215,000 of them conventional in type. FHA reports applications for materials priorities by mid-May involving more than 480,000 new homes.

Housing Expediter Wyatt, on the other hand, warns against unwarranted optimism. These are "start estimates" only, he makes clear, and critical shortages of materials are handicapping builders throughout the country in going ahead with structures. Shortages are expected to extend the construction for most dwellings from the normal four months to six or seven months.

Premiums a New Tool

About the time critical building materials hit their worst period of suffering from the 60-day coal strike, the Veterans Emergency Housing law became effective, giving the government a new tool — premium payments — for securing increases in production.

An inter-agency committee from RFC, OES, CPA, NHA and OPA is arranging assignments through task committees for each critical material. Payments are designed to defray extra costs of expanded production by existing plants, costs of reopening of plants closed during the war, and to draw in certain high-cost plants subsidized during the war but not operating since. Wyatt expresses the belief that price adjustments as a production incentive had gone about as far as they could by late spring.

Sidelights Interesting

Out of the government's comprehensive reports on civilian production (by CPA) come interesting sidelights. For instance, new access roads to out-of-the-way government timber stands are expected to add at least 100 million board feet to this year's lumber production and 500 to 600 million feet next year. Further, the Forest Service has agreed to overcut South and West timber beyond normal yield for an emergency period as was done during the war.

New green veneer mills near otherwise unlogged timber, plus new plants and new dryers and lathes in existing plants are expected to increase plywood capacity one fourth by New Year's.

On the other hand, flooring manufacturers have been having trouble getting rough lumber. Those with their own sawmills sometimes find it more profitable to sell the lumber than to convert it into flooring.

Cities Must Plan

With the veterans' housing program under way, Expediter Wyatt is placing emphasis on the role of states and communities in planning home developments. Problems of health and safety regulations, highways to make suburban localities commutable, withholding deferrable public construction, obtaining temporary housing as a stop gap, amending building codes — these are all in the state and community province, he points out.

Expert city planning is vital to the program, he reiterates in speeches and releases, and is equally as important as the quantity aspect. "If the communities jam their houses together on crowded gridiron streets without proper arrangements for light and air, if they fail to provide adequate health facilities," he warns, "they are the ones who will be saddled with the slums these will inevitably become."

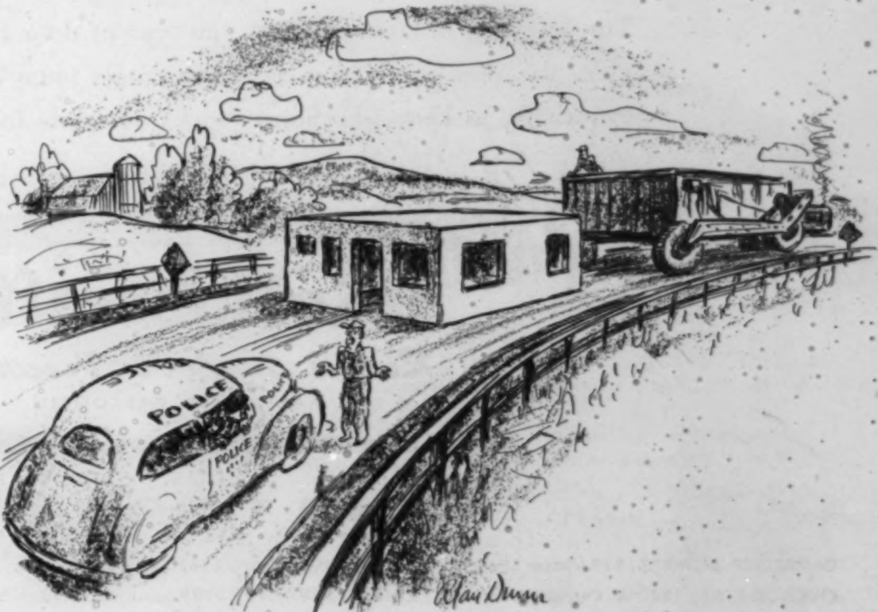
Wyatt's Powers Broad

Not all powers given to the Housing Expediter, under the Veterans Emergency Housing Act, are generally known. For instance, he can order other government agencies, including the Economic Stabilization Office and OPA, to accommodate their actions to the housing program. In fact, he is given all the authority of the Office of War Mobilization and Reconversion to carry out the housing program.

It is understood well enough that he can fix maximum sales prices on new houses, require certification for sales, establish priorities on materials, insure mortgages up to 90 per cent, make premium payments to stimulate production, and provide market guarantees for new type materials and prefabricated houses.

It is less well known that he can arrange price increases for major structural changes or improvements after a first sale under the Act, can forbid export of lumber or other housing materials, and can obtain court injunctions against

(*Continued on page 10*)

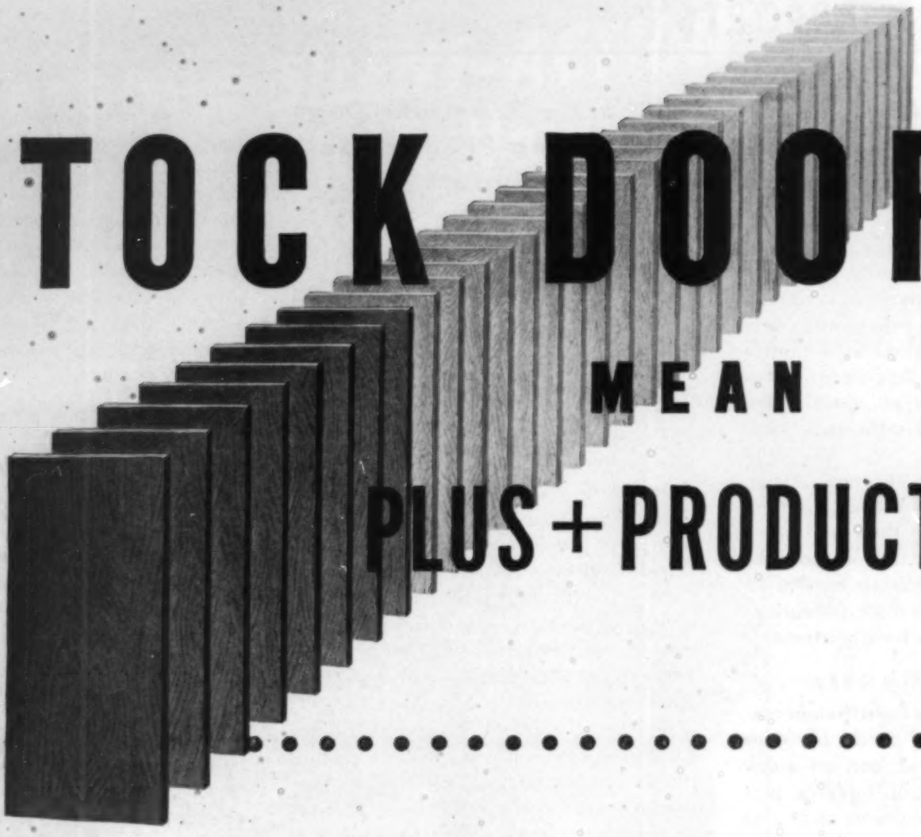


"I'm terribly sorry about our new Tournalayer, sir — we didn't know it was loaded!"
— Drawn for the RECORD by Alan Dunn

STOCK DOORS

MEAN

PLUS + PRODUCTION



Roddiscraft's progressive policy is directly in line with modern practice—production on a scale designed to provide more solid core flush doors for everybody, to speed deliveries as much as possible to maintain the high quality of Roddiscraft doors. We believe this policy will not only mean the greatest good for the greatest number now, but also in the future when production more nearly matches demand.

The building of stock doors—one type of door in stock sizes—provides the plus production needed to meet today's requirements and eventually to keep warehouse stocks adequate for immediate needs.

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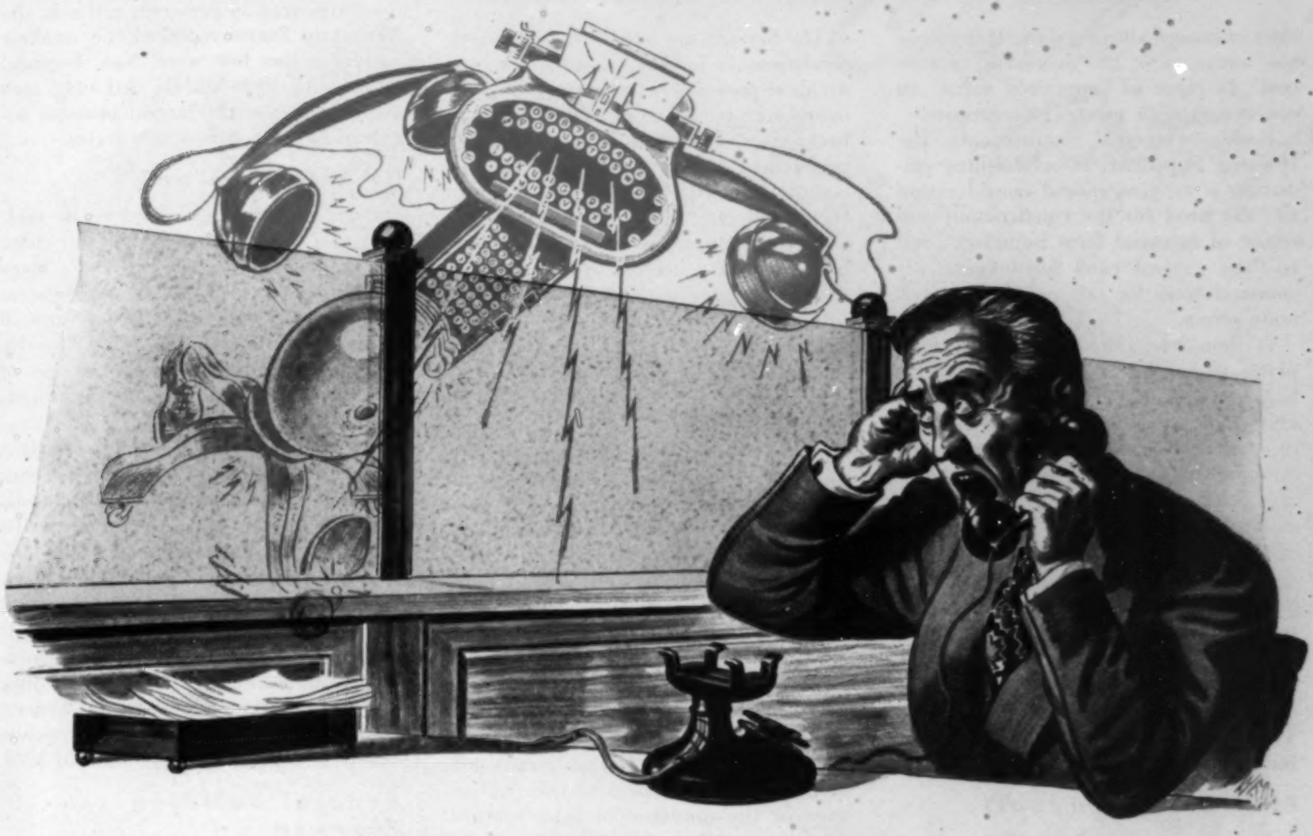
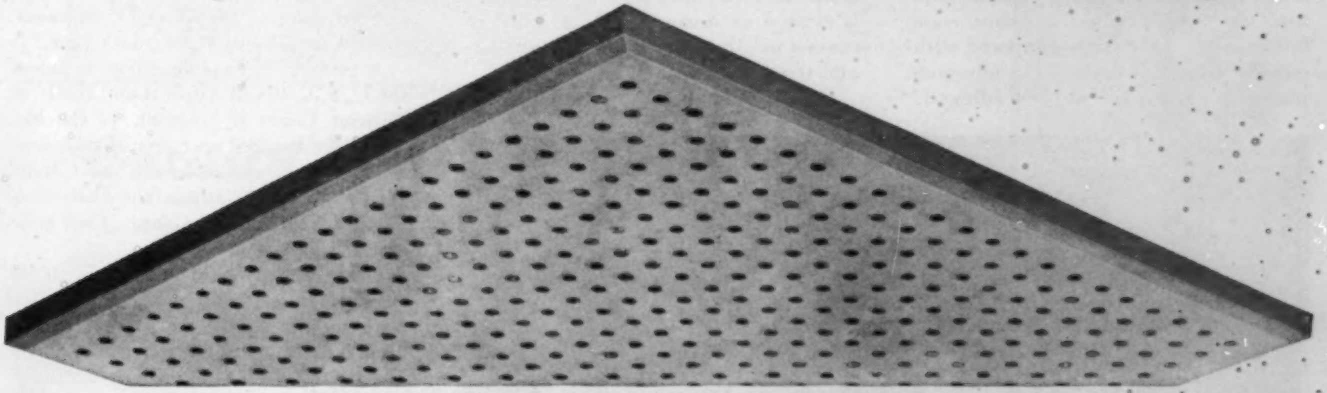
DEALERS IN ALL PRINCIPAL CITIES

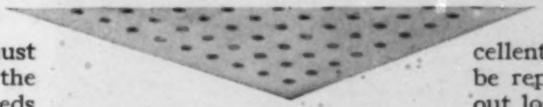
You can't shout down Noise Demons



But you can trap them with this ceiling

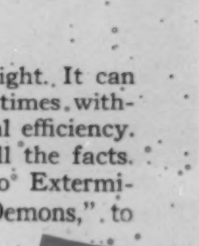


It's Armstrong's Cushiontone



WHEN YOUR CLIENT must raise his voice above the din of office noise he only breeds more noise demons. In fact, loud talk combines with clattering machines, shrill bells, and hurrying feet to cause noise demons. And it's a well-known fact that noise demons wear out nerves, fray tempers, and reduce efficiency of office workers.

But you can end noise demons, once and for all, with a ceiling of Armstrong's Cushiontone.* This economical, fibrous material has 484 deep holes per square foot which absorb up to 75% of all noise reaching the ceiling. Cushiontone is an excellent reflector of light. It can be repainted many times without loss of acoustical efficiency. **Free booklet** gives all the facts. Write for "How to Exterminate Office Noise Demons," to Armstrong Cork Company, 2407 Stevens Street, Lancaster, Penna.



*Reg. U. S. Pat. Off.

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM AND ASPHALT TILE

sales of houses above ceiling. He can use his "estimate of the necessary current cost" in place of "appraised value" in connection with mortgage insurance.

Besides veterans' requirements, the Housing Expediter, in establishing priorities, is to give special consideration to "the need for the construction and repair of essential farm buildings" and to "the general need for housing accommodations for sale or rent at moderate prices."

It should be noted that he contemplates using the guarantee of markets in the prefabrication field for "lower cost units incorporating unusual methods of construction or those placing emphasis on materials not normally used in housing, such as aluminum, concrete or plastics."

NHA calls attention to new materials already brought to light, which fall into two general classes: panels or entire dwelling units made from lightweight concrete, and structural panels made from plastics, aluminum and other substitutes for lumber and plywood. The panels, it points out, are adaptable for floors, walls, partitions and roofs.

FHA Offers Layouts

In a move to tie in with the veterans' program, the Federal Housing Administration has drawn up a series of small-home layouts for general guidance and use. The agency says that many small homes could have been improved without affecting their cost if FHA minimum planning standards had been followed.

The layouts are suggested subject to conditions in local markets and to individual preferences. Elevations and dimensions have been omitted, says FHA, because of variations in local market preferences and to avoid implication of competition with professional architectural services.

Of six layouts, one is a two-story row house and five are one-story detached dwellings, three without basement. All provide living room, two bedrooms, full kitchen and bath, and some provide separate dining space.

Home Ownership Up

Some striking facts have been turned up by the Bureau of Labor Statistics on wartime changes in home ownership. The war period, reports the Bureau, saw a rapid and continuous shift from tenancy to home ownership, a shift more rapid than in the boom decade of the 1920's. With construction of new homes curtailed, much of the increase in ownership came by withdrawal of dwellings from the rental market.

Rent control limited the earnings from rental property, the Bureau points out, and encouraged owners to take advantage of the unrestricted sales market. Most generally affected were single-family rental dwellings, hence adding to the present housing difficulties of veterans. In many instances the ownership is classed as insecure due to sharp increases in sales prices, forced purchases, and temporary residence.

On a regional basis, the Bureau found that for all cities the median increase in the proportion of owner-occupied dwellings was 28 per cent; cities in the Mountain States reported the smallest increase; also low were New England cities with the Middle Atlantic area slightly higher; the largest changes occurred in the Southeastern states.

Officers and directors of the A.I.A. at the Miami Beach convention. Left to right, seated: John L. Skinner, Miami; Charles F. Cellarius, Cincinnati, treasurer; Alexander C. Robinson, III, Cleveland, secretary; James R. Edmunds, Jr., Baltimore, president; Samuel E. Lunden, Los Angeles, vice president; Paul Gerhardt, Jr., Chicago. Standing: Ralph O. Yeager, Terre Haute, Ind.; A. W. Archer, Kansas City; Angus McIver, Great Falls, Mont.; L. H. Provine, Urbana, Ill.; Douglas W. Orr, New Haven; Earl T. Heitschmidt, Pasadena, Calif.; Joseph D. Leland, Boston. Not in the group are directors William S. Kaelber, Rochester, N. Y., and Branson Gamber, Detroit. Story of convention on p. 142

NHA to Live on?

One task facing Congress before mid-July was definite disapproval, if it chose to disapprove, of the President's three reorganization plans for the administrative agencies, including the National Housing Agency, announced May 16. If Congress fails to disapprove any of the plans within 60 days, it automatically becomes effective.

Among other things, Reorganization Plan No. 1, the President explains, consolidates "permanently in one National Housing Agency under the direction of a National Housing Administrator the main activities of the government relating to housing." In effect, the plan continues the wartime setup. It puts permanently under NHA the Federal Housing Administration, the Federal Public Housing Authority, and the Federal Home Bank Administration. It dissolves the U. S. Housing Corporation of 1918.

Federal Building Planned

The architect of the Capitol, David Lynn, has revealed postwar construction plans in and about the Capitol area. Few, if any, of the projects, however, will get under way before next year.

A Federal Courts Building to house the U. S. Court of Appeals and the U. S. District Court is eminent on the list. It will be located on Constitution Avenue about two blocks from the Capitol grounds and will adjoin the District of Columbia Municipal Center. Cost is estimated at $10,300,000.

Other plans include an annex to the Senate Office Building, a garage and park development for the House of Representatives, and extension of the Central East Front of the Capitol Building. A block now occupied by apartments and other structures on the southwest corner of the Capitol grounds is to be purchased later.

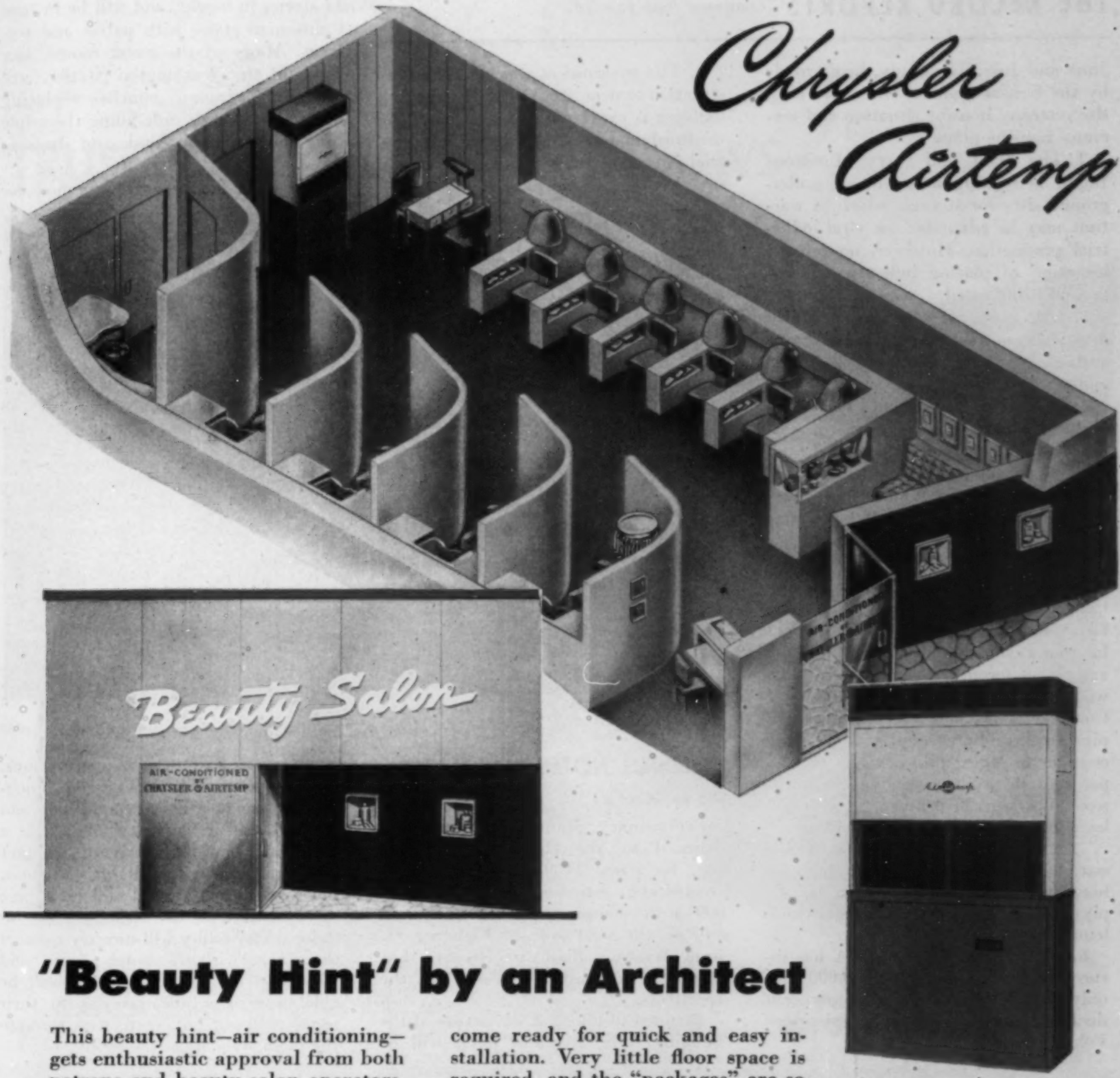
Vital Notes

In keeping abreast of federal developments in construction, vital odds and ends pile up. Note these:

1. In the wake of a Veterans Administration survey, announced in June, showing more than 60 per cent of a representative group of veterans without suitable homes or apartments three or four months after discharge, NHA is sponsoring a national veterans' housing survey during the two months of

(*Continued on page 12*)

Chrysler Airtemp


Beauty Salon
AIR-CONDITIONED BY CHRYSLER AIRTEMP
AIR-CONDITIONED BY CHRYSLER AIRTEMP

"Beauty Hint" by an Architect

This beauty hint—air conditioning—gets enthusiastic approval from both patrons and beauty salon operators. Refreshingly cool, filtered air, with excess moisture removed, is thoroughly appreciated on a hot summer day. Women make a habit of patronizing air conditioned shops. Operators like it because they can do better work and handle more appointments when they're comfortable.

The ideal air conditioner for a beauty salon—or for any kind of shop or store—is the "Packaged" Air Conditioner by Chrysler Airtemp. It's a simplified form of air conditioning. The well engineered "packages" come ready for quick and easy installation. Very little floor space is required, and the "packages" are so flexible in application that they fit well into any plan. They are easy to move—a big advantage when remodeling or changing locations.

Chrysler Airtemp pioneered "Packaged" Air Conditioners. Behind them is Chrysler Corporation and its fine reputation for engineering and mass production skill—your assurance of high quality at low cost. For details, architects are invited to write to Airtemp Division of Chrysler Corp., Dayton 1, Ohio. In Canada: Therm-O-Rite Products, Ltd., Toronto, Ont.

"Packaged" Air Conditioner

Engineered for very long life . . . noted for low-cost operation and upkeep . . . equipped with the famous Chrysler Airtemp sealed radial compressor . . . can be installed singly or in multiple . . . heating coil can be added to "package" for year 'round air conditioning.

CHRYSLER AIRTEMP

HEATING · COOLING · REFRIGERATION

THE RECORD REPORTS (*Continued from page 10*)

June and July. The study, being made by the Census Bureau, will cover both the veterans' housing situation and veterans' housing plans.

2. The Army and Navy Munitions Board is making a survey of underground sites for storage, which in wartime may be adaptable for vital industrial production. However, no present intention of placing industries underground is indicated.

3. CPA and NHA had to cut down drastically on non-housing construction authorization for the month of June and the first half of July.

4. Temporary extension of War Shipping Administration authority to operate as a carrier in intercoastal and coastwise trading was asked of the Interstate Commerce Commission.

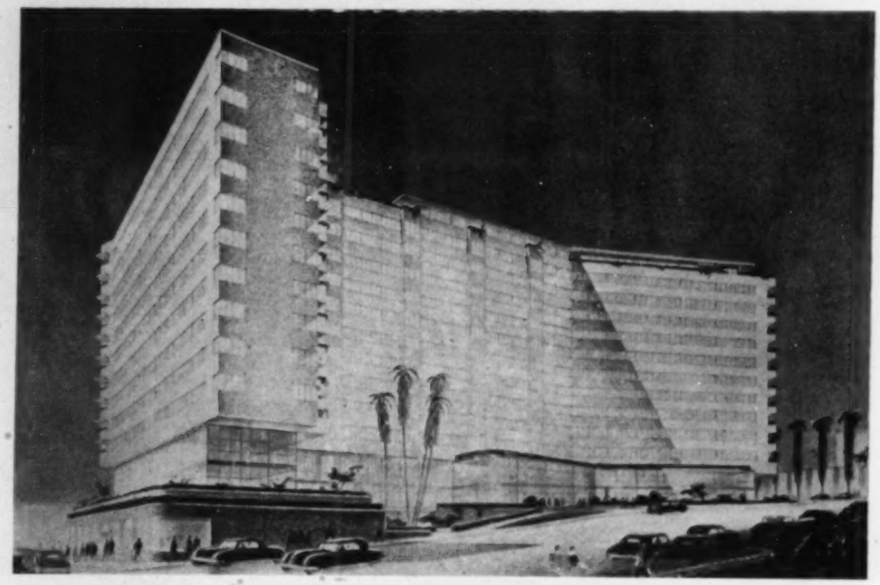
5. CPA recently cut in half the amount of plywood a builder can use on a house or apartment.

6. Additional price increases prior to Congressional action on OPA include $2 per thousand board feet on mill prices for round edge northeastern white pine and $3.50 for other northeastern softwood and for Douglas fir on the West Coast; a 23 per cent boost for western pine stock millwork and 26 to 29.6 per cent for fir stock millwork; 4.5 to 12.5 per cent in producer ceilings on hardwood flooring; 20 per cent at the mill level for western pine house moldings.

7. Rosin exports will be curtailed until October 1 to safeguard supplies for housing. (Used particularly in paints, plywood, wallboard, rubber and linoleum.)

8. In the last 12 years FHA has insured loans totaling $2,135,000,000 with only $11,700,000 or ½ of 1 per cent declared uncollectible, Commissioner Foley reports.

9. The government expects 1946 construction to near $20 billion. Residential building is expected to reach a peak in the third quarter of the year while industrial construction is expected to climb steadily, quarter by quarter.



Architects' rendering of the new 1400-room Statler Hotel planned for Los Angeles

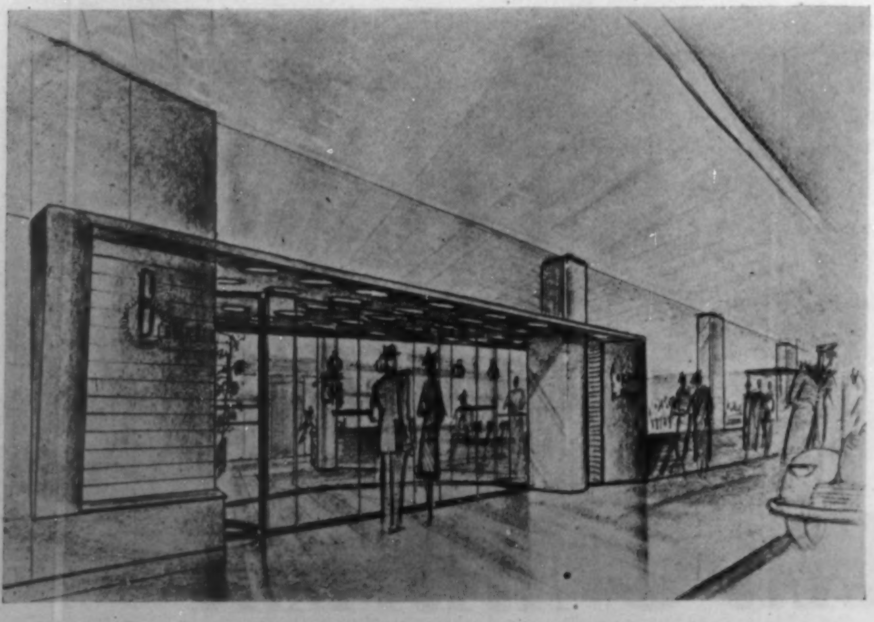
BUILDING NOTES

New Hotel

Preliminary plans have been announced by the Hotels Statler Co., Inc., for a new 1400-room hotel, to be erected at an estimated cost of $14,000,000 on the company's recently acquired site on the west side of Figueroa St. from Wilshire Blvd. to 7th St., Los Angeles. Holabird and Root are the architects.

Planned to take full advantage of the building code, the new hotel will be 13 stories in height, and will be in true Californian style, with patios and terraces. Many of the guest rooms, like those in the Washington Statler, will be living-bedrooms, couches replacing beds, and a single unit filling the triple function of bureau, desk and dressing table.

Elaborate facilities are planned for such public functions as conventions, group meetings, banquets and luncheons. Included will be a main ballroom with a seating capacity of 1,287, a secondary ballroom, private banquet and dining rooms — all on one floor. Below the ground level will be garage accommodations for 400 cars; an interior motor lobby will directly connect the garage with the hotel proper, and guests arriving by automobile will be able to register and proceed to their rooms without having to pass through the main sections of the lobby.



Proposed entrance to the Bismarck Hotel, Chicago, following extensive reconstruction

Hotel Renovation

Complete reconstruction of the ground floor is planned for the Bismarck Hotel in Chicago as part of a modernization program estimated to cost $1,000,000. Work will begin as soon as materials are available.

Existing shops and stores on the ground floor, including the "165 Cocktail Lounge," will be moved, rebuilt or replaced. These, and a proposed street floor restaurant, will be built of a combination of new materials emphasizing structural glass and metals. The main lobby on the second floor will be rearranged so that all services, such as transportation, theater tickets, public telephones, telegraph and public stenographer, will be conveniently grouped at one end in an area to be known as the Service Center. The west end of the lobby will be shortened to accommodate

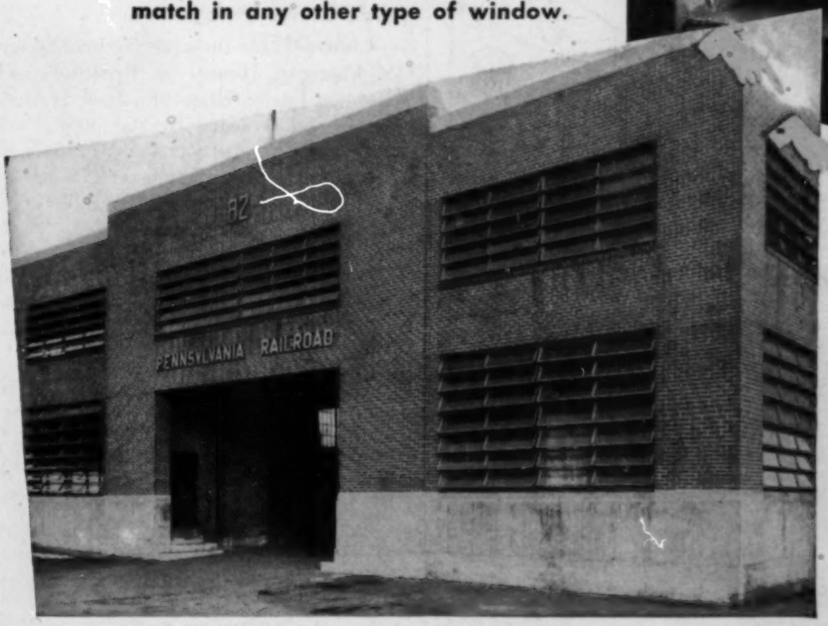
(*Continued on page 14*)

TRUSCON MAXIM-AIR WINDOWS

Good-looking

whether you're inside looking out . . .

This exclusive Truscon design will produce striking architectural effects in keeping with the modern emphasis on horizontal lines. In addition, the unique advantage of completely controlled ventilation to suit varying climatic conditions, and the outstanding advantage of positive insect screen protection at all times, offers functional superiority that is difficult to match in any other type of window.



or outside looking in!

Recognition of the above Truscon features is rapidly expanding the usage of the Maxim-Air design in hospitals, institutions, schools and office buildings.

See SWEET'S for full mechanical details of this efficient, good-looking window.

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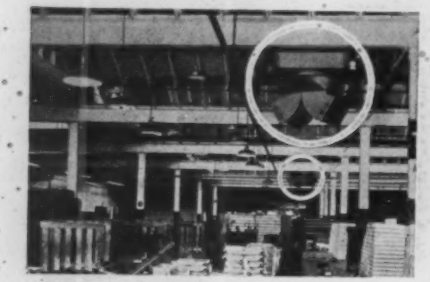
DO WHAT NO OTHER FORM OF PLANT HEATING CAN DO

Not just another unit heater, the WING REVOLVING HEATER is unique in that it does what no other heater can do—its slowly revolving outlets gently distribute the heat continuously in a constantly changing direction. It reaches over, around and under obstructions into out-of-the-way corners, its moving streams of heated air quickly warm up a plant in the morning and its properly warmed, healthful air currents thoroughly distributed, create a sensation of live, invigorating comfort for the workers. Wing Revolving Unit Heaters are used in many of the country's leading industrial plants. Write for a list of installations.



Above: Wing Revolving Unit Heaters in a typical low ceiling type of installation. Revolving Heaters are also made for practically any height roof or ceiling.

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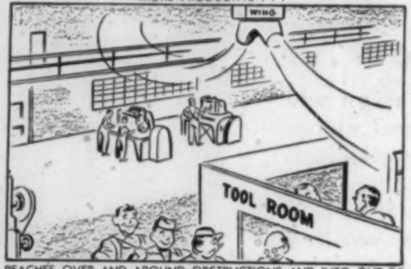
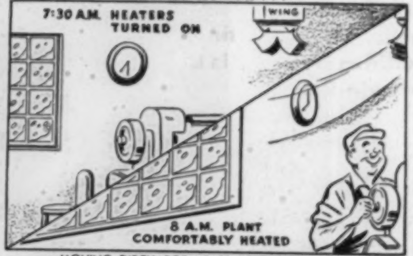
WING

MAKES WORKERS FEEL COMFORTABLE, LIVE AND INVIGORATED—MORE PRODUCTIVE . . .



REACHES OVER AND AROUND OBSTRUCTIONS AND INTO OUT-OF-THE-WAY CORNERS . . .



MOVING DISCHARGE HEATS UP PLANT QUICKLY

WING
ABSENTEE ZERO

REDUCES ABSENTEEISM DUE TO COLDS RESULTING FROM DRAFTS, CHILLS OR OVERHEATING

IS AN EXCELLENT COOLING SYSTEM IN SUMMER WITH STEAM OFF AND FANS ON

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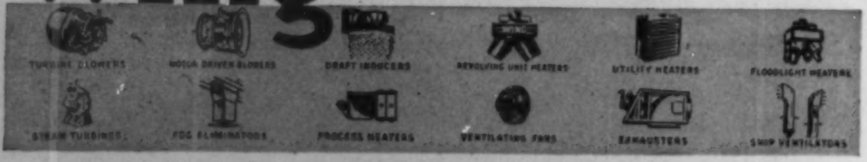
Wing REVOLVING UNIT HEATERS



THE RECORD REPORTS

(Continued from page 12)

reception rooms for newly created banquet space.

A new hotel entrance will be to the east of the present entrance, with revolving glass doors leading into a small foyer. Opposite the door will be a flower shop with glass walls from floor to ceiling so that floral window displays may enhance the attractiveness of the foyer. An escalator, just inside the new main entrance and parallel to the building's front wall, will be of extra width to permit guests and bellboys to carry luggage with maximum comfort. The escalator will lead to the main lobby, with luggage racks at the top of the well to facilitate the handling of luggage in the lobby.

Air conditioning, at present confined to the dining rooms, cocktail lounges and private dining rooms, will be extended to the entire building including all guest rooms and public areas. Sidewalks outside the hotel will be heated in winter to protect guests from the hazards of snow and ice, and a new sidewalk-width canopy will be installed, extending from the hotel entrance to the adjoining Palace Theater. The entire modernization program is under the supervision of Kem Weber, West Coast designer.

Housing Projects

Contracts for the architectural design of Farragut Houses in Brooklyn and Stephen Foster Houses in East Harlem have been awarded by the New York City Housing Authority to the firm of Fellheimer and Wagner and Karl A. Vollmer, Associate, and to William I. Hohauser respectively.

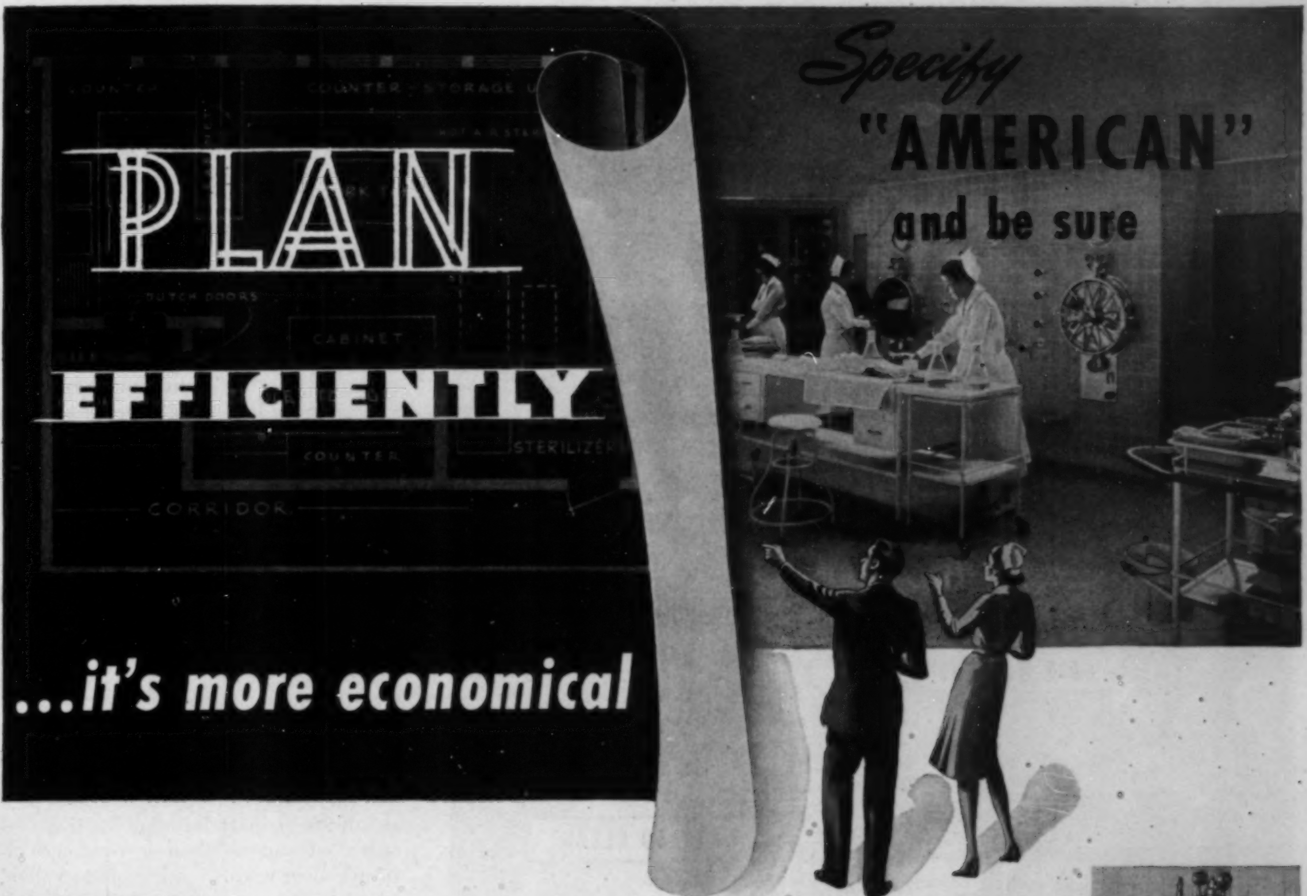
The two recently approved state-aided projects will have a total estimated capacity of 2720 families. Each will have a children's center and space for social and craft rooms.

London Plans

The ribbon-building indulged in after World War I is not to be repeated in England, reports Joan Littlefield from London, but instead every effort is being made to build in neighborhood units, each containing its own shops, school, community center, library and clinic.

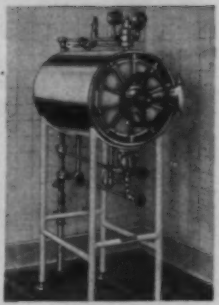
Many London boroughs have schemes ready to go into operation the moment men and materials are available. On a 9¾-acre estate in Becher Street, Kensington, for example, the local council plans to erect 302 dwellings, giving a density of 32.5 homes and 136 persons per acre. There will be 20 houses of six rooms for the larger families up to eight persons; 48 four-room apartments for families of five; 24 larger four-room apartments which will accommodate

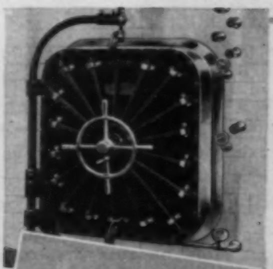
(Continued on page 16)



INSTRUMENT and UTENSIL STERILIZERS . . .
which provide for complete utilization of available power and automatic control of rate of heating. EXCESS VAPOR REGULATOR eliminates losses usually sustained through wasteful creation and disposal of steam.

DRESSING and INSTRUMENT STERILIZERS . . .
Precision equipment of functional dependability. SMALL INSTRUMENT STERILIZERS in portable and cabinet models featuring "burn-out-proof" safety.





BULK STERILIZERS . . .
the outcome of wartime engineering efficiency. Unexcelled for sterilization of dry surgical supplies, mattresses, bedding, etc.

WATER STILLS . . .
in which a thermometer permits operator to gauge performance at all times and to accurately adjust regulating valve. Provides safety against "burn-out" and cleaning simplicity that means longer periods of operation.

Sterilizers, Autoclaves and Stills for every Central Supply, Surgical Supply and Private Office need. Our experienced Planning Service is at your disposal.

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NOW YOU CAN HAVE SAFER, TOUGHER, LONGER LASTING TRENCH, MANHOLE AND HATCH COVERS
GRIP WITHOUT A SLIP!
EASY TO CLEAN!
EASY TO MATCH!

Overnight you can convert worn and broken trench covers, loading platforms, stairways and similar surfaces into non-skid working areas. How? By using AW Super-Diamond Floor Plate, just as thousands of large and small plants throughout the country are doing. The Engineered AW Super-Diamond pattern grips without a slip and prevents costly accidents. Then too because the design has no square corners it is easy to clean, and it drains and dries rapidly. Here is the most economical floor plate ever developed. Oil, fire and heat resistant. Even the heaviest traffic does not damage it and it can be quickly cut and installed in your plant because the continuous pattern is easy to match.

End your floor maintenance headaches now! Get complete information by writing for your free copy of the helpful 16 page booklet L-25. Alan Wood Steel Co., Conshohocken, Pa.

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THE RECORD REPORTS

(Continued from page 14)

six; 96 three-room apartments for four; and 18 one-room suites for single people. These will be contained in three-story blocks. There will also be eight-story blocks comprising 64 three-room and 32 two-room apartments. The buildings, planned in a north-south direction to receive both morning and afternoon sun, will be separated by grassed and tree-planted courtyards. By raising the mid-section of the two eight-story blocks by a floor and a half above normal ground level, ample height is provided below for a social center, with tenants' club room in the front block and a nursery playroom with milkbar in the rear block. All apartments will have private balconies; utility rooms with laundry appliances are provided in the three-story blocks.

NEW ZONING LAW

The Los Angeles City Council has adopted a new comprehensive zoning ordinance, prepared and submitted by the City Planning Commission.

The new ordinance contains many new and important zoning features such as off-street parking and loading, removal of non-conforming uses, agricultural zoning in the San Fernando Valley, etc. It embraces 16 zones: two agricultural, one suburban, five dwelling, four commercial, one central business, and three industrial. Each zone is under a separate section of the ordinance and embraces all of the use, height and area regulations pertaining thereto, save for certain provisions and exceptions of a general nature.

Earl O. Mills, planning consultant of St. Louis, Mo., served as consultant to the Planning Commission and prepared the text of the new ordinance.

AIRPORT PLANNING

Radar Control Tower

The first radar-equipped control tower for civilian flying was unveiled at the Indianapolis Airport on May 24 by the Civil Aeronautics Administration.

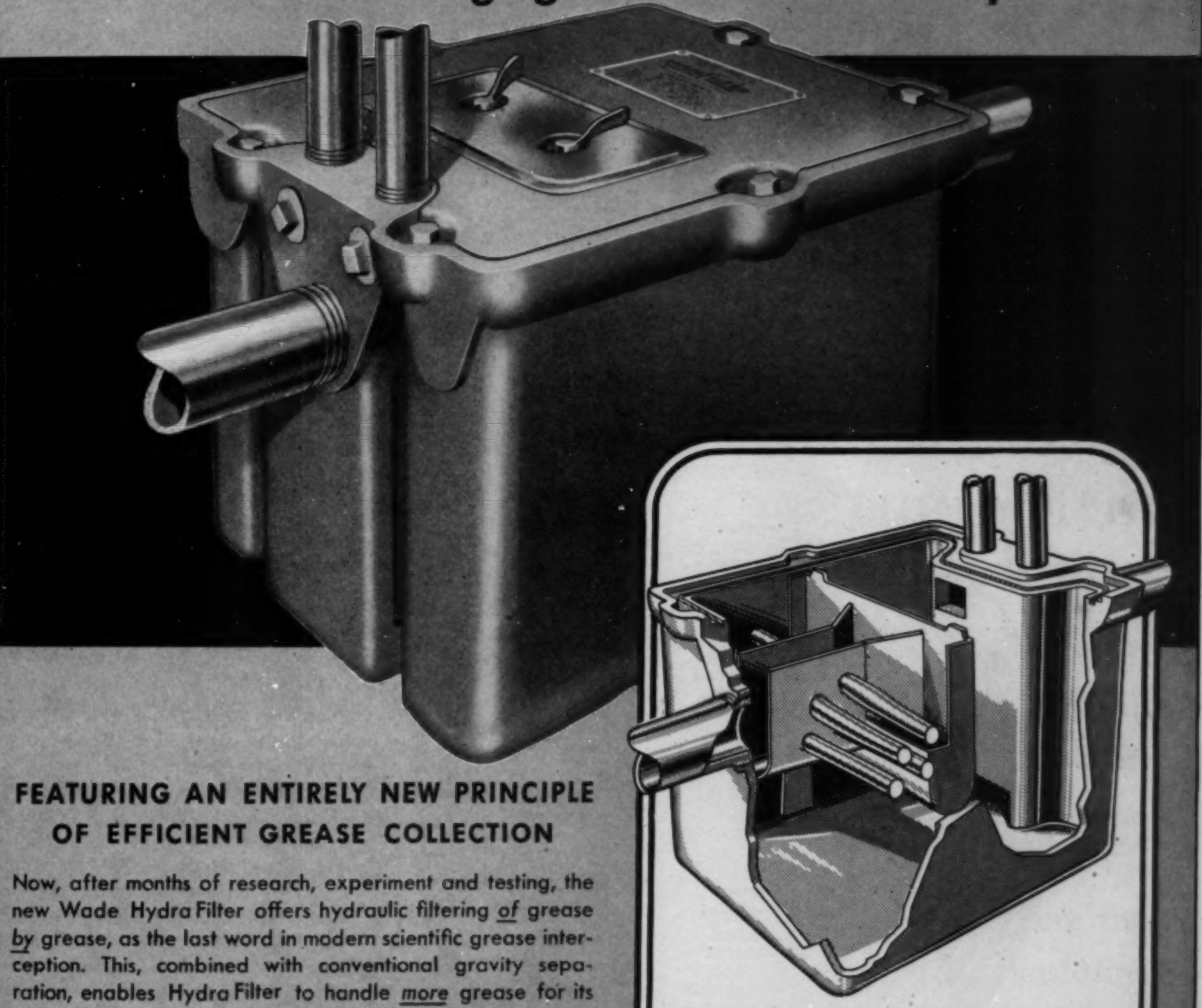
The tower employs a console screen, constructed by the CAA after many experiments with military versions of radar equipment, to give the controller a "plan-picture" of all aircraft within 30 miles of the airport. The picture appears on a cathode ray tube screen, 12 in. in diameter, and from it the regular control tower operator safely and speedily can schedule departure and approach of aircraft without being hampered by poor visibility.

The basic radar equipment which supplies signals to the tower screen is known as the Navy "SG." It was built by the Raytheon Co. and modified at Indianapolis under direction of Raytheon engineers

(Continued on page 18)

New-Different-Better

the WADE
HYDRAFILTER
double-acting grease interceptor



FEATURING AN ENTIRELY NEW PRINCIPLE OF EFFICIENT GREASE COLLECTION

Now, after months of research, experiment and testing, the new Wade Hydra Filter offers hydraulic filtering of grease by grease, as the last word in modern scientific grease interception. This, combined with conventional gravity separation, enables Hydra Filter to handle more grease for its size, more efficiently. Other features:

1. Guaranteed efficiency 90%, with actual installations testing much higher.
2. Non-clogging selective action to catch heavier solids, pass lighter ones;
3. Simplified maintenance, at longer intervals;
4. Full selection of sizes for all requirements; home, restaurant, hotel and institution.

You are invited to compare the Wade Hydra Filter with any other grease trap for efficiency . . . compactness . . . low maintenance costs . . . Full details will be mailed on request.

A layer of grease built up around a series of tension tubes hydraulically filters most of the grease from incoming waste liquids.

Final gravity separation takes place over a smooth floor that cannot catch and clog with solid matter. A special insert cover allows easy removal of collected grease. Optional top-side air vents prevent siphoning action.

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DRAINS AND PLUMBING SPECIALTIES
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EBERHARD FABER U.S.A.
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HI-DENSITY

MICROTOMIC
"VAN DYKE"
The EBERHARD
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Drawing Pencil

BETTER BLUEPRINTS

naturally result from more opaque pencil tracings . . . and more opaque pencil tracings result from using a lead that gives off a denser line—one that is solidly black. The special HI-DENSITY Lead made by our exclusive MICROTOMIC process leaves nothing to be desired . . . For your personal satisfaction, try one and discover the drawing pencil with the quality touch.

18 Degrees from 7B to 9H with Round Leads . . . Plus 6 Degrees with special Chisel Point Leads.

THE RECORD REPORTS

(*Continued from page 16*)

to include many late improvements developed for the Navy. Among these are the Moving Target Indication, which allows only moving aircraft to appear on the screen, eliminating disturbing "ground clutter" from reflection of waves by nearby objects. Another change is installation of an improved search antenna, which rotates on top of a 65-ft. steel tower. This permits the CAA operator to "see" airplanes at high elevation above the station as well as those at horizontal distances.

Instrument Landing

Instrument landing systems are now being installed by the CAA at 81 airports throughout the country, 31 of them for the Army. In the next fiscal year an additional 31 systems will be installed for civil use. The system consists of a localizer, glide path and marker beacons.

CONSTRUCTION UP AGAIN

Construction contracts were awarded for 52,733 projects costing $734,911,000 in the 37 states east of the Rocky Mountains in April to top March's total of $697,593,000 and that of April of last year, which amounted to $395,798,000, F. W. Dodge Corporation figures show.

That architects, engineers and building organizations are breaking construction records established during the war years by substantial amounts is reflected in the dollar volume totals for the first four months. This year's January to April contracts amounted to $2,177,404,000 in the eastern states, compared with $1,859,944,000 in the corresponding period of 1942 when wartime volume was highest.

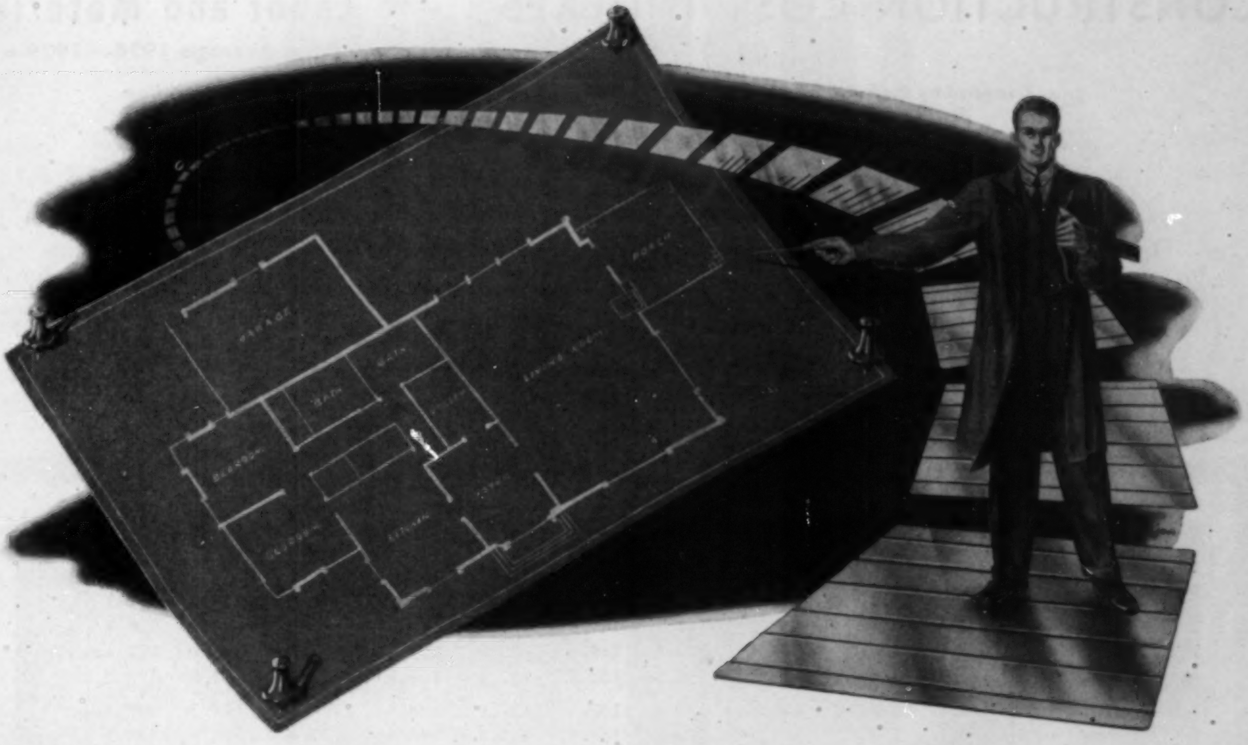
Residential construction contracts in April totaled $370,590,000, which represented an eight-fold gain over the corresponding month of last year, and a gain of nearly $100,000,000 over March. More than 50,000 residential units are called for in the April awards, all but 2 per cent, as measured by dollar volume, being private construction as differentiated from publicly-owned dwellings.

Nonresidential building declined slightly in April from March's total and that of April last year, reflecting an anticipated trend resulting from the Civilian Production Administration's Veterans Housing Program Order No. 1 issued on March 26. The comparative nonresidential construction contract totals follow: April, 1946, $236,182,000; March, 1946, $278,725,000; April, 1945, $241,107,000.

G.I. HOUSING HELP

A "Veterans' Home Guidance Service" has been organized in Philadelphia to

(*Continued on page 134*)



EVERY ROOM IN THE HOUSE

a world of modern comfort, built with STEEL insulation

Wherever new homes are being built . . . wherever old homes are being remodelled . . . more and more architects and builders are specifying Ferro-Therm, the modern reflective all-steel insulation . . . that keeps 90 to 95% of all radiant heat just where it belongs . . . Reduces fuel costs by 20-30% . . . Remains 100% efficient for the life of the building.

Ferro-Therm, for all its steel sturdiness, is thin and flexible . . . and comes in light, easy-to-handle sheets . . . ready for immediate and *permanent* installation . . . Also ideal for special remodelling jobs where the right kind of insulation transforms a musty attic or cold, damp cellar into a comfortable playroom, den or library . . . Write for information.

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AMERICAN FLANGE & MANUFACTURING CO., INC. **STEEL INSULATION** **30 ROCKEFELLER PLAZA, N. Y. 20, N. Y.**

CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929=100

Compiled by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data collected by E. H. Boeckh & Associates, Inc.

	NEW YORK					ATLANTA				
	Residential		*Apts., Hotels, Office Bldgs.*	*Commercial and Factory Buildings*		*Residential*		*Apts., Hotels, Office Bldgs.*	*Commercial and Factory Buildings*	
Period	*Brick*	*Frame*	*Brick and Concr.*	*Brick and Concr.*	*Brick and Steel*	*Brick*	*Frame*	*Brick and Concr.*	*Brick and Concr.*	*Brick and Steel*
1920	136.1	136.9	123.3	123.6	122.6	122.8	122.9	108.6	109.8	105.7
1925	121.5	122.8	111.4	113.3	110.3	86.4	85.0	88.6	92.5	83.4
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
1940	126.3	125.1	132.2	135.1	131.4	91.0	89.0	96.9	98.5	97.5
1941	134.5	135.1	135.1	137.2	134.5	97.5	96.1	99.9	101.4	100.8
1942	139.1	140.7	137.9	139.3	137.1	102.8	102.5	104.4	104.9	105.1
1943	142.5	144.5	140.2	141.7	139.0	109.2	109.8	108.5	108.1	108.7
1944	153.1	154.3	149.6	152.6	149.6	123.2	124.5	117.3	117.2	118.2
1945	160.5	161.7	156.3	158.0	155.4	132.1	133.9	123.2	122.8	123.3
Jan. 1946	173.1	173.7	169.8	170.4	167.0	137.9	138.4	127.4	127.3	127.0
Feb. 1946	173.1	173.7	169.8	170.4	167.0	140.8	142.6	130.4	128.9	128.9
Mar. 1946	174.9	175.6	172.1	172.9	169.0	141.2	143.0	133.6	129.3	129.3
Apr. 1946	175.5	176.2	172.9	173.5	169.6	141.2	143.0	131.3	129.5	130.1
May 1946	180.3	180.6	177.4	179.3	174.7	144.7	147.2	133.2	131.0	131.3
	% increase over 1939					*% increase over 1939*				
May 1946	**45.9**	**47.5**	**35.7**	**34.4**	**34.3**	**67.7**	**77.1**	**40.1**	**34.5**	**38.6**
	ST. LOUIS					SAN FRANCISCO				
1920	118.1	121.1	112.1	110.7	113.1	108.8	107.5	115.2	115.1	122.1
1925	118.6	118.4	116.3	118.1	114.4	91.0	86.5	99.5	102.1	98.0
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.4	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
1940	112.6	110.1	119.3	120.3	119.4	106.4	101.2	116.3	120.1	115.5
1941	118.8	118.0	121.2	121.7	122.2	116.3	112.9	120.5	123.4	124.3
1942	124.5	123.3	126.9	128.6	126.9	123.6	120.1	127.5	129.3	130.8
1943	128.2	126.4	131.2	133.3	130.3	131.3	127.7	133.2	136.6	136.3
1944	138.4	138.4	135.7	136.7	136.6	139.4	137.1	139.4	142.0	142.4
1945	152.8	152.3	146.2	148.5	145.6	146.2	144.3	144.5	146.8	147.9
Jan. 1946	157.7	158.3	150.8	152.6	149.5	148.6	146.4	146.7	148.3	149.3
Feb. 1946	157.7	158.3	150.8	152.6	149.5	150.6	147.7	149.2	151.1	150.3
Mar. 1946	158.8	159.5	151.1	152.8	149.9	154.0	153.0	151.8	151.8	152.3
Apr. 1946	159.5	159.8	152.7	155.0	152.1	155.3	153.7	153.8	154.6	154.5
May 1946	162.2	163.0	154.3	155.8	153.1	157.6	156.1	155.7	156.5	156.2
	% increase over 1939					*% increase over 1939*				
May 1946	**47.2**	**52.3**	**30.0**	**30.1**	**28.7**	**49.2**	**57.2**	**32.6**	**28.3**	**34.1**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A=110
index for city B= 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95}=0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110}=0.136$$

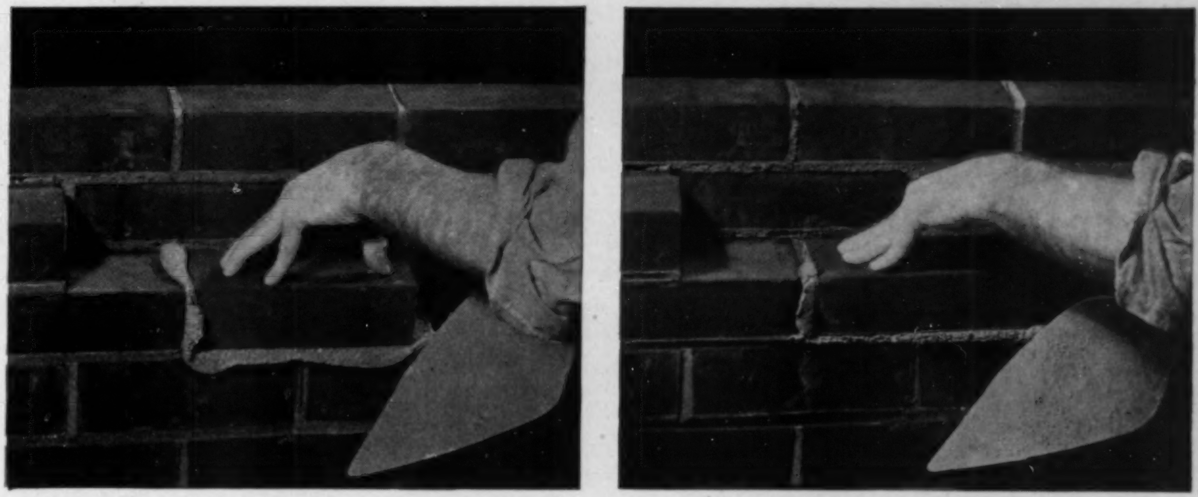
Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published legal prices, thus, indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.

BRIXMENT MORTAR

Is More Plastic



To compare the plasticity of any two mortars, try shoving a brick into place, with a full head joint. The more plastic the mortar, the easier the work. Try this with Brixment mortar!

AND GOOD PLASTICITY IS THE FIRST REQUIREMENT OF GOOD MORTAR

One of the most important characteristics any mortar can possess is *plasticity*. Within certain limits, plasticity is the greatest single factor not only in the *economy* of the brickwork, but also in its strength, its neatness, and its resistance to the passage of water.

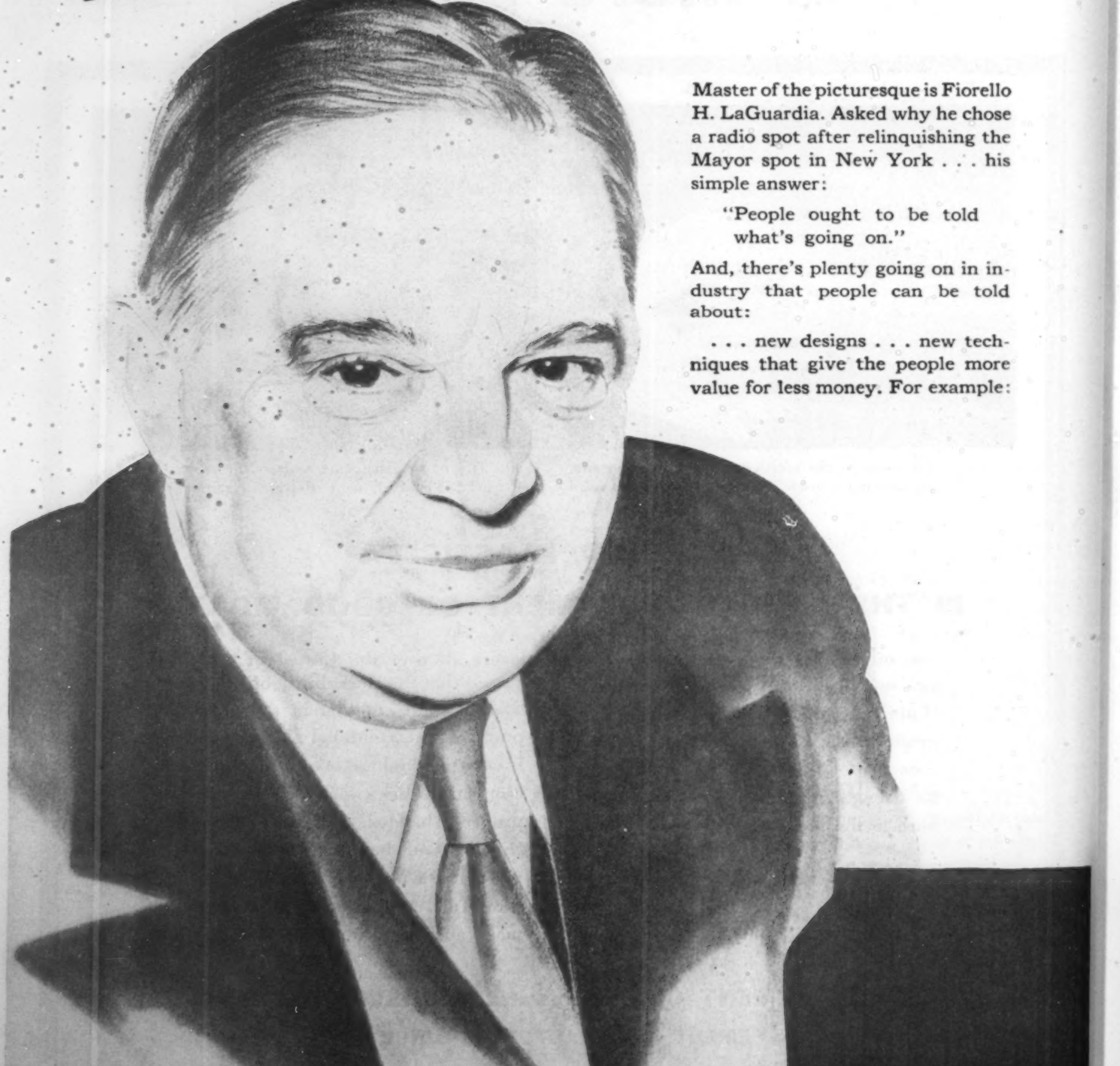
One of the outstanding characteristics of Brixment mortar is its unusual plasticity. For twenty-five years, bricklayers all over the United States have agreed that the workability of Brixment is comparable to that of straight lime putty. This exceptional plasticity makes it easy for the bricklayer to secure neat, economical brickwork, with the brick properly bedded, and the joints well filled. And because of this unusual plasticity, a bag of Brixment will carry three full cubic feet of sand and still make an ideally workable mortar.

LOUISVILLE CEMENT CO., Incorporated, LOUISVILLE 2, KENTUCKY

CEMENT MANUFACTURERS SINCE 1830

then he said to himself:

Tell the people what's cookin'



Master of the picturesque is Fiorello H. LaGuardia. Asked why he chose a radio spot after relinquishing the Mayor spot in New York . . . his simple answer:

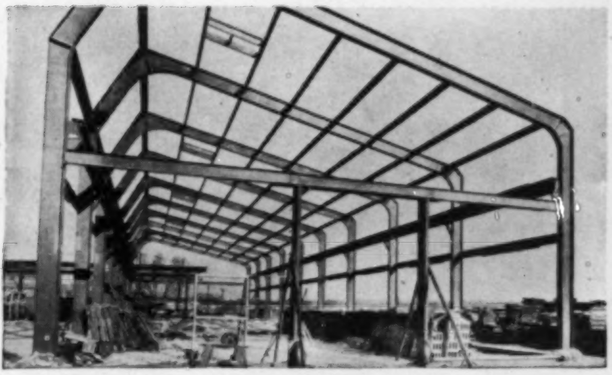
> "People ought to be told what's going on."

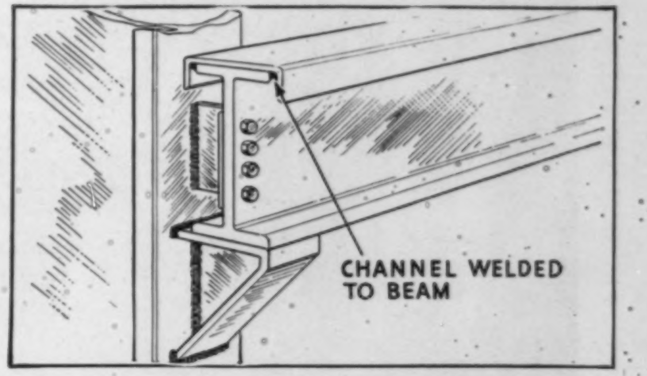
And, there's plenty going on in industry that people can be told about:

. . . new designs . . . new techniques that give the people more value for less money. For example:

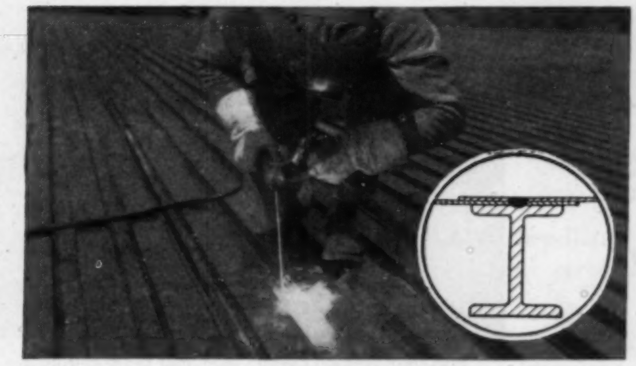
LOOK, MR. LA GUARDIA, how architects and engineers are stepping out in front with welded design:

"Cooking" with Welded Design

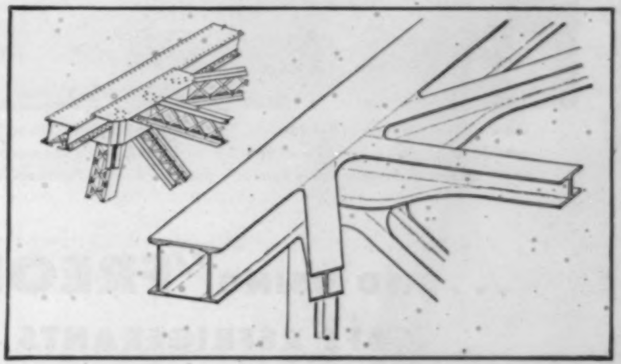




CREATING A BETTER FACTORY. Improvements such as this rigid frame structure are made possible by arc welding. Improves appearance and lighting. Reduces maintenance. Cuts tonnage 15% to 25%. Only 300 man-hours required for erection of this 50 ft. x 179 ft. structure because of maximum use of pre-fabrication. Frames built from 18″ x 85 lb. beams. Purlins are 10″ x 15 lb. Crane beams are 18″ x 47 lb. reinforced with 10″ channel welded to top flange (see sketch). Courtesy: Crown Iron Works Co., Minneapolis.



SIMPLIFYING ROOF INSTALLATION. Panels of 20-gauge formed sections are applied by plug welding them to purlins. Enamel was broken with a hammer, and 5/32″ "Fleetweld 5" with 200 amps. penetrated through sheet and welded it to purlin. Total of 1680 welds made in 14 hours. Architect: Cutting & Ciresi, Cleveland.

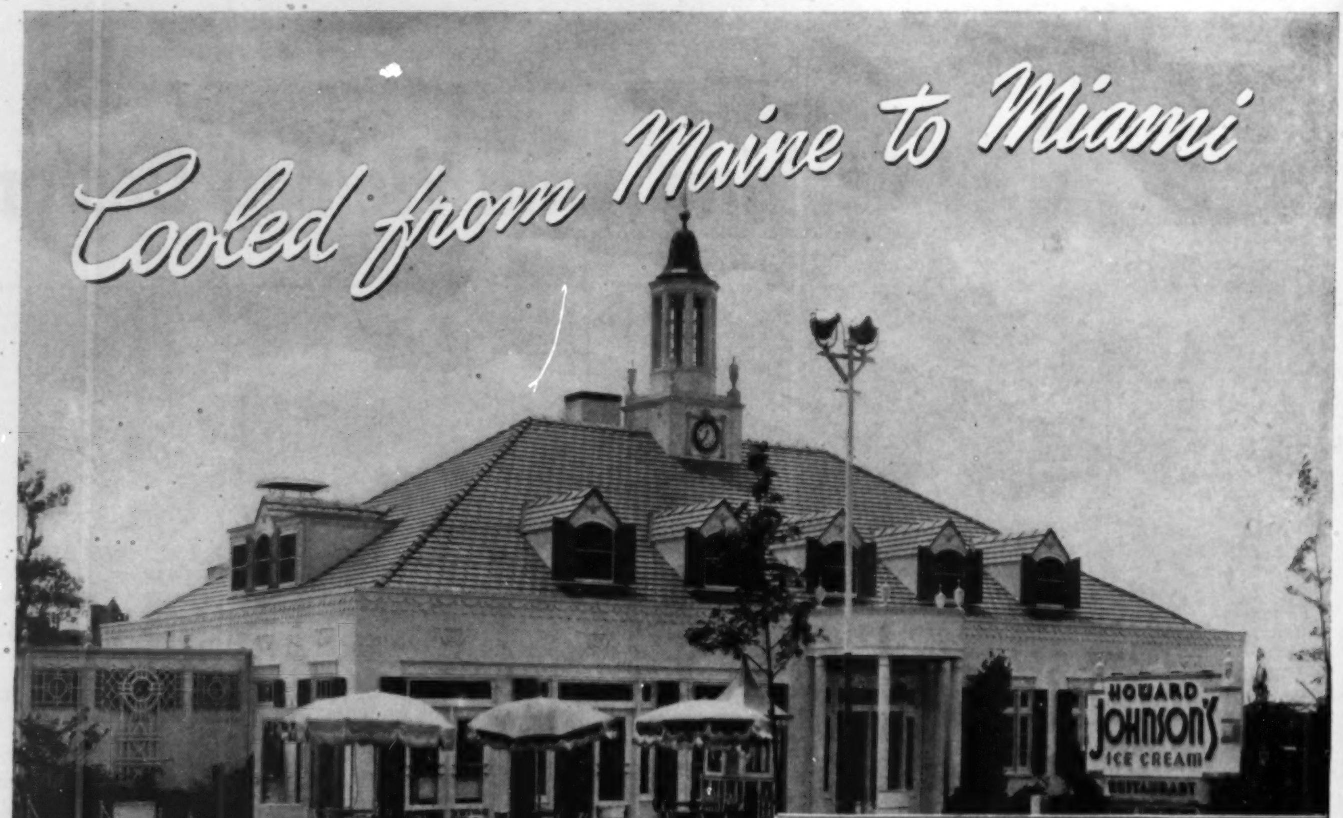


30% LIGHTER. Welded design of lateral bracing eliminates lacing bars, rivets, ring fillers and tie plates—cuts weight 30%—is rigid, strong, streamlined, and easy to paint and maintain. Members are made of standard shapes and plate. Conventional riveted design shown on left. Full discussion in S.S.A.W. Plate 102. Free on request to structural engineers and designers.

THE LINCOLN ELECTRIC COMPANY • DEPT. 322 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING


Cooled from Maine to Miami
HOWARD JOHNSON'S ICE CREAM RESTAURANT

View of typical Howard Johnson's, air conditioned with "Freon." Even when outside dry bulb readings soar to 95°F. or above, room temperatures of 10° to 15° cooler at 50% relative humidity are maintained for shock-less comfort

A modern Johnson's dining room that seats 250 people.

. . . AND USING "FREON"
SAFE REFRIGERANTS

Over a hundred of the famed Howard Johnson's restaurants, catering to America-on-wheels from Maine to Miami, are air conditioned by equipment using "Freon" safe refrigerants. These cool, comfortable dining rooms rest and refresh the traveler—make him want to stop at a Johnson's again.

"Freon" refrigerants assure dependable, efficient and safe performance in modern air conditioning systems. They are odorless, non-toxic, non-flammable . . . even direct contact will not harm foods. That is why architects and engineers everywhere endorse "Freon" for *protective insurance* in restaurants and all other types of buildings.

In Johnson's restaurants, "Freon" refrigerants are used in York, Air-Temp and Carrier air conditioning units of from forty to ninety h.p. The purity and low moisture content of "Freon" add years of life to these compact, modern systems . . . vital parts won't corrode.

Carry the safety and long-range profitability of "Freon" in mind with you to your drafting board . . . specify equipment designed to utilize the advantages and the benefits of "Freon" refrigerants. Write for complete information for your files. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington, Delaware.

KINETIC
REG. U. S. PAT. OFF.

FREON
REG. U. S. PAT. OFF.

safe refrigerants

"FREON" IS KINETIC'S REGISTERED TRADE MARK FOR ITS FLUORINE REFRIGERANTS AND PROPELLENTS.

A.W. FABER "Columbus" 5543 ★ RED
MADE IN U.S.A.
A.W. FABER "Columbus" 5545 ★ BLUE
MADE IN U.S.A.

"Another convert to the LOYAL ORDER OF NOODLERS!"

said Nilmerg

DESIGNER: Is that a new secret Society?

NILMERG: There's nothing secret about it. I see you using one of those wonderful COLUMBUS Crayon Pencils — therefore I know you are a Noodler.

DESIGNER: You refer to my practice of noodling up drawings by giving them extra brilliance and *verve* with broad strokes of this thick crayon pencil?

NILMERG: Indubitably. And that's just the pencil for it, too. COLUMBUS Colored Crayon has a wax composition with superb *adhering* qualities for broad area layouts, sketches, renderings, map making, etcetera.

DESIGNER: Want to know a trade secret? COLUMBUS Crayon makes me feel like a bloomin' Botticelli. I get vivid effects that go over swell with clients.

NILMERG: I have heard many artists, architects, engineers and draftsmen express similar sentiments.

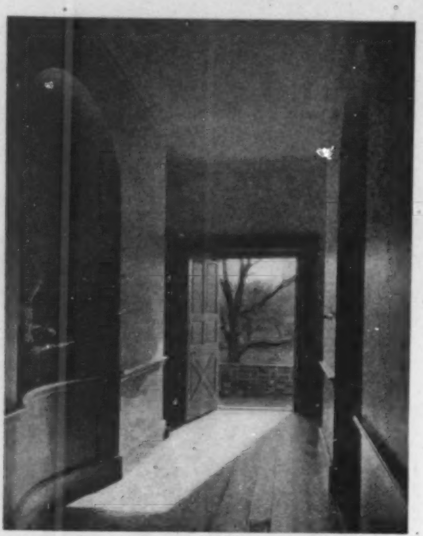
DESIGNER: Little man, you are a benefactor to the Knights of the Drawing Table.

NILMERG: Thank you — and when ordering from your Dealer, be sure to get the whole COLUMBUS range — red, blue, black, brown, orange, white, yellow, vermilion, carmine, purple, green, light green, and combination red-and-blue.

A.W. FABER INC.
NEWARK, N.J.

COLUMBUS THICK
COLORED *Crayon Pencils*

REQUIRED READING



The west hall of Stratford, Westmoreland County. From "The Mansions of Virginia"

HOUSES BEAUTIFUL

The Mansions of Virginia; 1706–1776. By Thomas Tileston Waterman. Chapel Hill, N. C., University of North Carolina Press, 1945. 7 by 10¼ in. 456 pp. illus. $10.00.

Much has been written through the years of the stately pre-Revolutionary mansions of Virginia, but nothing heretofore published has equalled this study by the architectural director of the Historic American Buildings Survey. Not only are 45 of the mansions fully described and illustrated, but many new facts are presented relating to the architectural authorship and style of the various residences.

Starting with a chapter on the English antecedents of Virginia architecture, Mr. Waterman takes up in succession the 17th Century mansions, the Early Georgian period of 1706–1750, the Mid-Georgian of 1750–1765, and the Late Georgian, 1765–1776. Of necessity, considerable space is devoted to already familiar buildings such as the Governor's Palace at Williamsburg, Monticello and Mount Vernon. But even with these, new or unfamiliar material is presented.

Of particular interest are the results of Mr. Waterman's effort to track down the architects of the buildings. While much of his evidence is pure conjecture, it is such logical conjecture that in the absence of better-substantiated evidence, it is almost as acceptable as fact. Sir Christopher Wren, for example, is put forward with good reason as the architect of the Governor's Palace at Williamsburg. John Arris is presented as the designer of two groups of houses including Harewood, home of George Washington's brother Samuel; Mount Vernon; Carlyle House at Alexandria; and Blandfield in Essex County. And Richard Talliaferro is offered as the very probable architect of Rosewell, Sabine Hall, Wythe House and others.

The more than 350 photographs including both interiors and exteriors, and many details, are supplemented with numerous floor plans and elevations. A particularly useful feature of the book is the alphabetical summary giving the basic facts about each of the mansions discussed. Also included are over seven pages of bibliography and a glossary of architectural terms.

DOCTOR OF INDUSTRY

The Engineer in Society. By John Mills. New York (250 Fourth Ave.), D. Van Nostrand Co., Inc., 1946. 5½ by 8 in. xx + 196 pp. $2.50.

"It should not have required the development of an atomic bomb to direct attention to the political importance of science and engineering," writes Mr. Mills in his preface to this survey of the engineer's place in society. "Science has much it can contribute if its workers will undertake the task," he continues. "In its methods and their objectivity it has a promising untried technique for the solution of social problems which have been amplified by the elimination of 'remoteness' from the vocabulary of geography."

Although primarily concerned with the research scientist in industry, this highly interesting volume has many a bee to put into the bonnet of the engineer in any field of endeavor. Mr. Mills draws on 45 years of "intimate association with creative workers in science" for the observations and conclusions he presents — observations and conclusions on such varying topics as the round-peg-in-a-square-hole type of employment, the workability of aptitude tests, salary curves, and "exposition for engineers." To that last subject Mr. Mills devotes six chapters of exemplary exposition pointing up the need for clear thinking and writing in the engineering field.

SMALL TOWN CANVAS

Art in Red Wing. By Laurence E. Schmeckebier. Minneapolis, Minn., University of Minnesota Press, 1946. 6 by 9 in. 88 pp. illus.

Here is a new approach to town planning: a report on the artistic resources of a community, "and the means by which its citizens have exploited them during the ninety-odd years of its existence." In other words, here is a study of the cultural background of a community, offered as a basis upon which to plan for future development.

As Prof. Schmeckebier points out, this report demonstrates that "there is such a thing as art to be found in the average small community. It is, furthermore, one of the richest and most direct expressions of cultural life and has gone through a stylistic evolution parallel in many ways to the artistic and cultural growth of the country as a whole."

Several facts come bobbing up to the surface in this study. First, that Red Wing has a distinctive character of its own despite the hodgepodge mimicry of some of her architecture. Second, that where local materials and labor have been used, the result has been more pleasing and more in character. Third, that much of the commercial and business district of the town are pretty bad, but utterly typical of the small community all over the country. And fourth, that with wise planning, based on a sure knowledge of the town's history and existing character, the inherent beauty of the place can be made to overcome its superficial and borrowed ugliness.

FUN IN THE FAR NORTH

Recreational Resources of the Alaska Highway and Other Roads in Alaska. Prepared by the National Park Service. Washington, D. C., U. S. Govt. Prtg. Office, 1944. 9 by 11¼ in. illus. 50 cents.

Looking toward the expected influx of tourists into Alaska now that the war is over, the National Park Service has prepared this handsome report on the Territory's recreational possibilities. The greater part of the booklet is given over to a description of Alaska's chief drawing cards — a description enthusiastic and vivid enough to give any reader the wanderlust — and to a discussion of the existing facilities for the traveler. The balance is devoted to a carefully worked out plan for future development.

Some of the details of that plan are breathtaking in scope: development at Mentasta Lake of an area of approximately 6,400 acres as a vacation center to accommodate a maximum of 250 visitors at one time; establishment of major overnight tourist stopping-places at intervals of about 35 miles along the Alaska Highway and other roads in the Territory; reservation of a width of 300 feet on each side of the center line of traveled way of all roads as a right-of-way to protect scenic attractiveness. Sample plans and sketches of communities, lodges, cabins and recreational facilities are included.

BUILDING CONTROL

Uniform Building Code: 1946 Edition. Adopted by the Pacific Coast Building Officials Conference. Los Angeles, Calif. (124 W. 4th St.), Colling Publishing Co., 1946. 5¼ by 7¾ in. 312 pp. Cloth, $3.00; paper. $2.50.

One of the highlights of this new edition of the Pacific Coast code is inclusion

(Continued on page 28)

DESIGN
FOR COAL
"Fuel Satisfaction"

11,000,000 NEW AMERICAN HOMES . . .

WILL BE BUILT DURING THE NEXT FEW YEARS

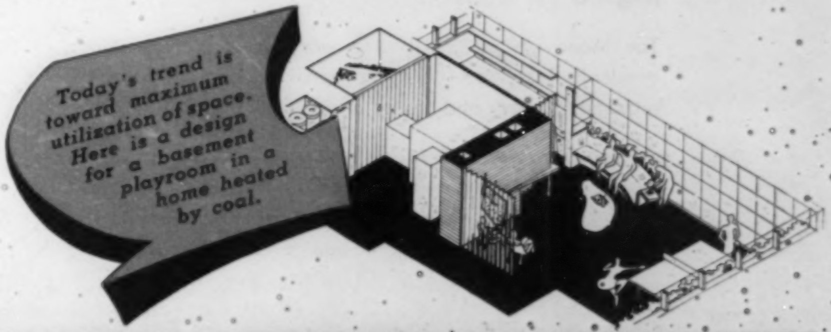
America must have 11 million new homes within the next 10 or 12 years. These homes will be heated by the plants you design, specify or install. The heating facilities you select will be one of the major factors in determining market value, sales appeal and owner satisfaction.

A coal heating plant is the most economical of all to operate and maintain. It is the only installation that can be converted to all other types of heating — this is important.

When you design or build, play safe, provide coal storage space and chimneys adequate for any fuel. Design for coal . . . "Fuel Satisfaction". It is economical, clean, quiet, odorless and abundant.

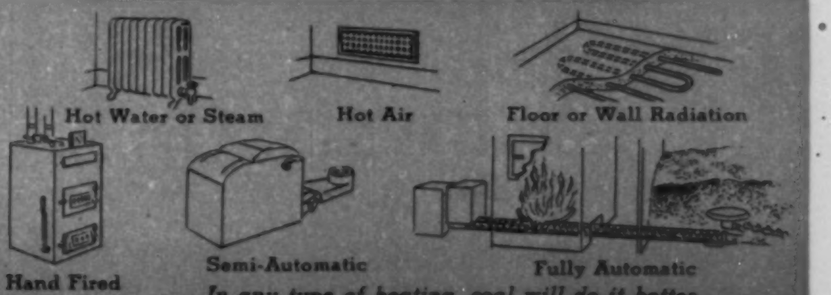
Check for These

- ✓ **INITIAL COST ECONOMY.** A hand-fired coal furnace is the least expensive of all central heating plants . . . an inexpensive heat regulator gives controlled heat.
- ✓ **AUTOMATIC HEATING.** The cost of a stoker-fired coal furnace is no greater than the cost of a good installation using any other fuel over a period of time . . . economy in cost of fuel is the saving.
- ✓ **FULLY AUTOMATIC HEAT.** The ultimate in cleanliness, comfort, convenience and economy, is a bin-fed, ash removal, coal burning stoker — the cost is little more than a regular stoker.
- ✓ **CLEAN, SMOKELESS FUEL.** Coal today is sized, cleaned, and dust-proofed at the mine.
- ✓ **PLENTIFUL FUEL SUPPLY.** We have a three thousand year coal reserve. Other fuels may be exhausted while your building is still relatively new.
- ✓ **CONVERSION POSSIBILITIES.** A conversion burner can be installed economically in a coal furnace. The reverse is not possible. Be safe, build in coal storage space and adequate chimneys . . . provide for coal.

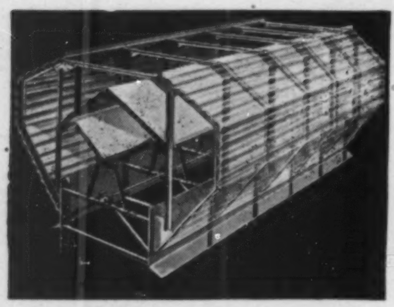

Today's trend is toward maximum utilization of space. Here is a design for a basement playroom in a home heated by coal.

Norfolk and Western RAILWAY

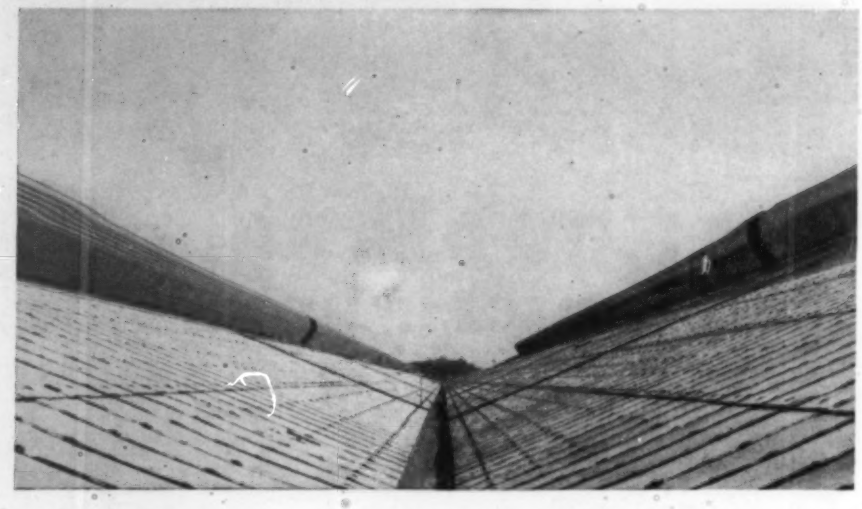
CARRIER OF FUEL SATISFACTION


Hot Water or Steam
Hot Air
Floor or Wall Radiation
Hand Fired
Semi-Automatic
Fully Automatic

In any type of heating, coal will do it better.



BURT MONOVENT CONTINUOUS RIDGE VENTILATOR



Airways to More Output Reduced Rejects and Less Time Off!

The improved Burt Monovent, as shown in the installation above, makes the roof ridge of your factory a gigantic valve that exhausts smoke laden, hot air along the entire length of the structure.

The Monovent assures better working conditions, which result in less absenteeism, improved product quality, maximum output and fewer accidents.

Particularly well adapted to metal working, but with applications throughout all industry, the Burt Monovent Continuous Ridge Ventilator is economical to install, and maintain, is highly efficient and blends architecturally with building lines.

Write—now for catalog and data sheets on Burt Monovent. It is one of Burt's complete line of ventilators which includes a size and type for every ventilating need.

The BURT MFG. Co.

48 E. South Street • Akron, Ohio, U.S.A.

MANUFACTURERS OF VENTILATORS, LOUVERS, OIL FILTERS, EXHAUST HEADS AND SHEET METAL SPECIALTY PRODUCTS

REQUIRED READING

(*Continued from page 26*)

of a chapter on prefabricated construction; another is the complete revision of the chapter on masonry. The entire code has been modernized to recognize new materials and to permit new uses of old materials, and throughout the results desired have been specified rather than the dimensions limited. The sole exception to this policy is in the chapter on masonry, where minimum dimensions of masonry-bearing walls are specified.

COLORADO CODE

Uniform Building Code of Colorado: 1945 Edition. Prepared by the Tri-County Regional Planning Commission. Denver, Colo. (State Office Bldg.), Colorado State Planning Com., 1945. 8½ by 11 in. 86 pp. mult.

Here is another good basic code, intended for easy adaptation to local conditions. As stated in the foreword, it "does not attempt to dictate choice of materials," but confines its stipulations to provisions for safety and health. Electrical and plumbing requirements are included, and one section covers plywood construction. To assist in the adoption of the code throughout the state, an appendix offers an outline of procedure for an unincorporated area to become eligible for the establishment of such a measure under the Colorado state law. Models of required petitions and a model resolution to be passed by the Board of County Commissioners also are provided.

Periodical Literature

HOSPITAL DESIGN

Changing Concepts in Hospital Function. . . . A Vital Consideration in Design. By Harvey Agnew, M.D. Toronto 1, Can. (57 Queen St. W.), Journal, Royal Architectural Institute of Canada, April, 1946, pp. 75–78.

"Of particular difficulty in determining the function — the many functions — of a hospital is the fact that these functions are never static," writes Dr. Agnew in this very timely and interesting article on hospital design. With no waste of words he tells of some of the changes of the past few years: new facilities provided, changes in procedures, trends toward shorter hospitalization periods and more specialized training of personnel, and so on. He discusses the relative importance of capital and operating costs, the effects of the shorter working day and the higher wages, the space-saving possibilities of more flexible planning, the probable effects of health insurance or socialized medicine. And last but most important to the architect, he suggests the various

(*Continued on page 150*)

ARCHITECTURAL

RECORD

MORE APARTMENTS FOR RENT!

THE desperate need for shelter, a place to live — any place to live — encourages building fast with whatever is at hand, on hastily developed land and from plans dashed off in a hurry. Such a technique sometimes has been known as "jerry-building" — the houses go up fast, sell fast, develop trouble fast, and foreclosure follows. This is about the quickest method known for providing future slums. While it may provide profit to the promoter-builder, and he performs a real service in providing a roof overhead, it is not the way any sane community would want to develop. It is at best *temporary* shelter masquerading as permanent.

What is the alternative to a rash of thrown-together future slum districts springing up all over the country? The obvious answer is garden-type apartments for rent — for reasons stated in our issue of last May — and accepted by authorities from Wilson Wyatt to the returned veterans themselves. Well-planned, well-built, well-managed apartments for rent are assets to the community and best fulfill the needs of the veterans. We have furthered the recognition of this fact by government officials, national and local, financial interests, veterans' organizations, manufacturers and architects alike.

It will take concerted action and independent action to develop and erect such projects — and quickly. If private enterprise is to provide decent housing, *enterprise* is needed, enterprise on the part of architects in promoting well-conceived apartment projects. This is a type of service to the community which architects can individually, or through their organizations, undertake to the advantage of all concerned. There is nothing unethical in finding backers, money, land, and ways and means — in preparing plans, in proving the economic and social validity of such a project. It will not be long before the political advantages of rental housing come to the fore. If private enterprise does not succeed now, in spite of the besetting obstacles, public housing will take over in a big way and probably at a time when the production of building supplies is more nearly normal.

There *are* besetting obstacles — rent ceilings, high material costs, scarcity of materials, restrictions, regulations, and red tape, threats of subsidized housing competition. How these are being met in your vicinity, others might like to know. We welcome all such helpful information, suggestions as to ways and means, plans, and descriptions of rental projects now under way or in the making. What are your biggest problems in producing multi-family apartments for rent? What are you doing to solve them, and with whom are you collaborating? Decent rental housing needs competent architectural and engineering services; your community needs the housing. Therein lies both the opportunity and the responsibility of the profession and of its individual members.

Kenneth K. Stowell
EDITOR

ARMY HEADQUARTERS BUILDING

Army Forces Middle Pacific Command, Fort Shafter, Oahu, T. H.

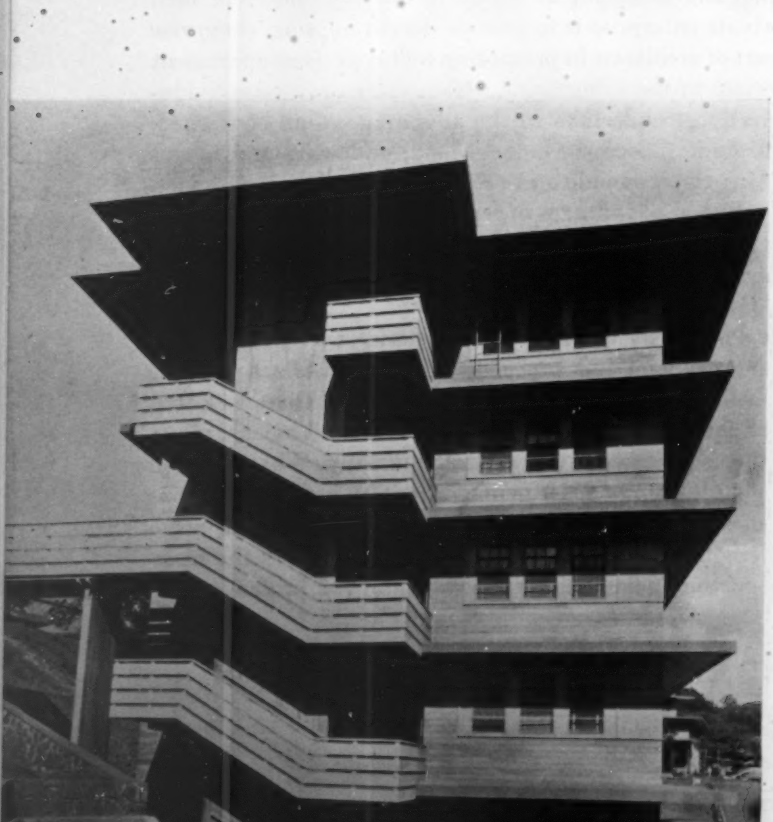
Since the war ended the Army has been free to acknowledge its debt to the architectural profession, and to permit publication of many really handsome buildings which, for all their evidence of design study, were built with remarkable speed and with materials most readily available. This one, built in May and June of 1944, brought together for efficient administration the H. Q. staff previously scattered throughout the Honolulu district. The post was already crowded, and the only available site was a steeply sloping one of two and a half acres.

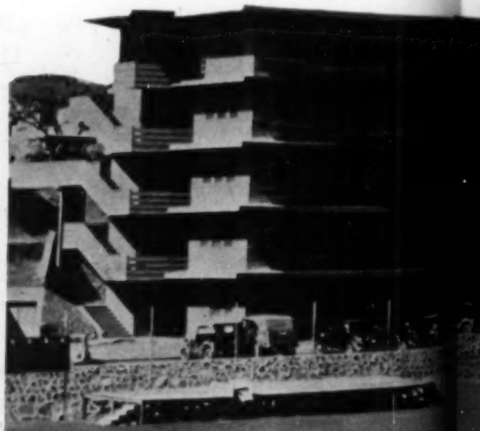
Designed by Cole McFarland with Randall B. Weaver as supervising architect, this building — it is really a group of three — was constructed with wood available at the time in Hawaii.

Exterior finish of all buildings is redwood horizontal drop-siding on which a soft green paint has been wiped. Fascias on the overhangs and columns at the entrance of building "A" are dark maroon. Windows have been architecturally banded together with flush vertical boards and are spaced 3 ft. 6 in. O.C. for maximum plan flexibility. These bands are painted a light blue-green and, with the 4 ft. overhanging aquamedia casting a deep shadow, emphasize horizontality.

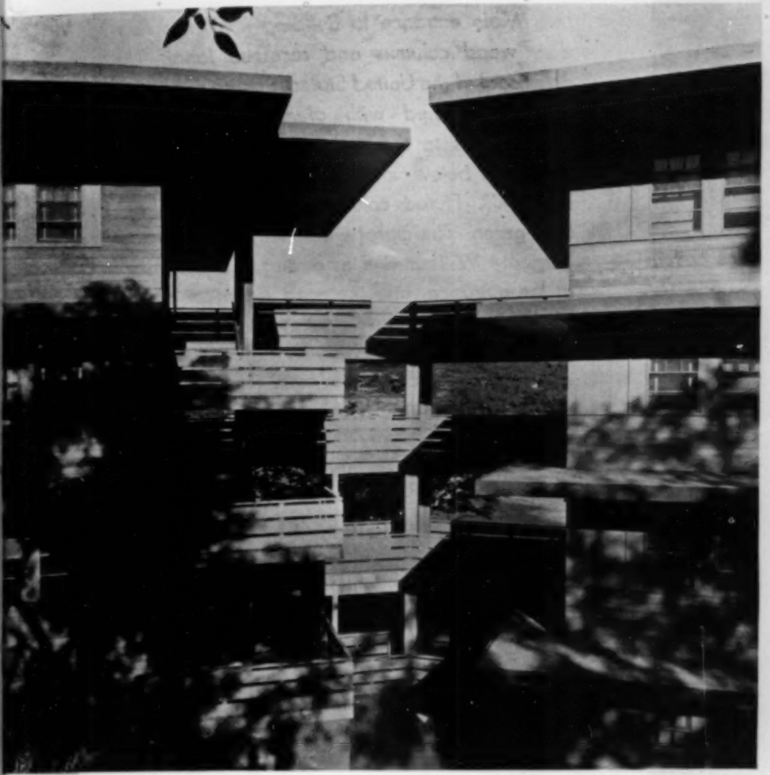
Fire walls of 8 in. concrete tile, with concrete lintel at each floor, divide the floor space of all buildings into approximately 3,000 sq. ft. fireproof sections. The firewalls extend from ground to roof and, with the exception of fire doors in the corridors, completely close off each part of the building.

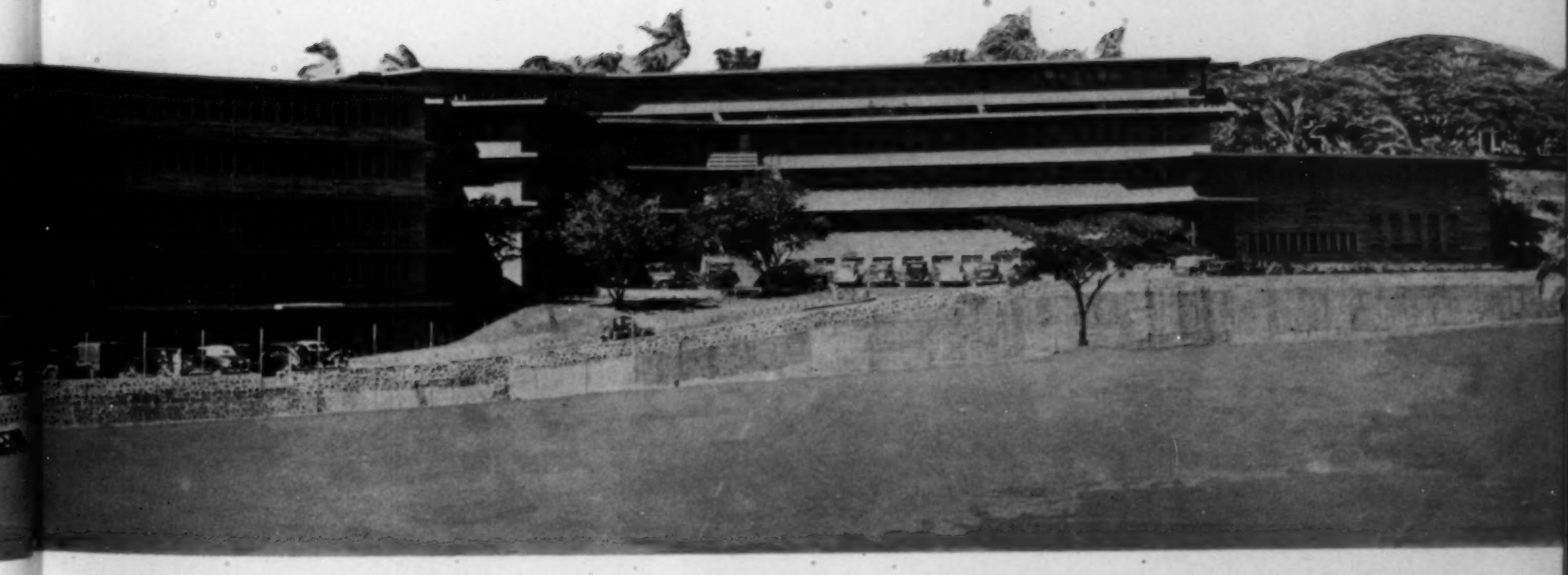
The effect of this structure on the architectural design of other military buildings in the Hawaiian Islands has been tremendous. Several other office buildings as well as two air terminal buildings, numerous barracks and recreation centers, etc., incorporate features of the headquarters unit.



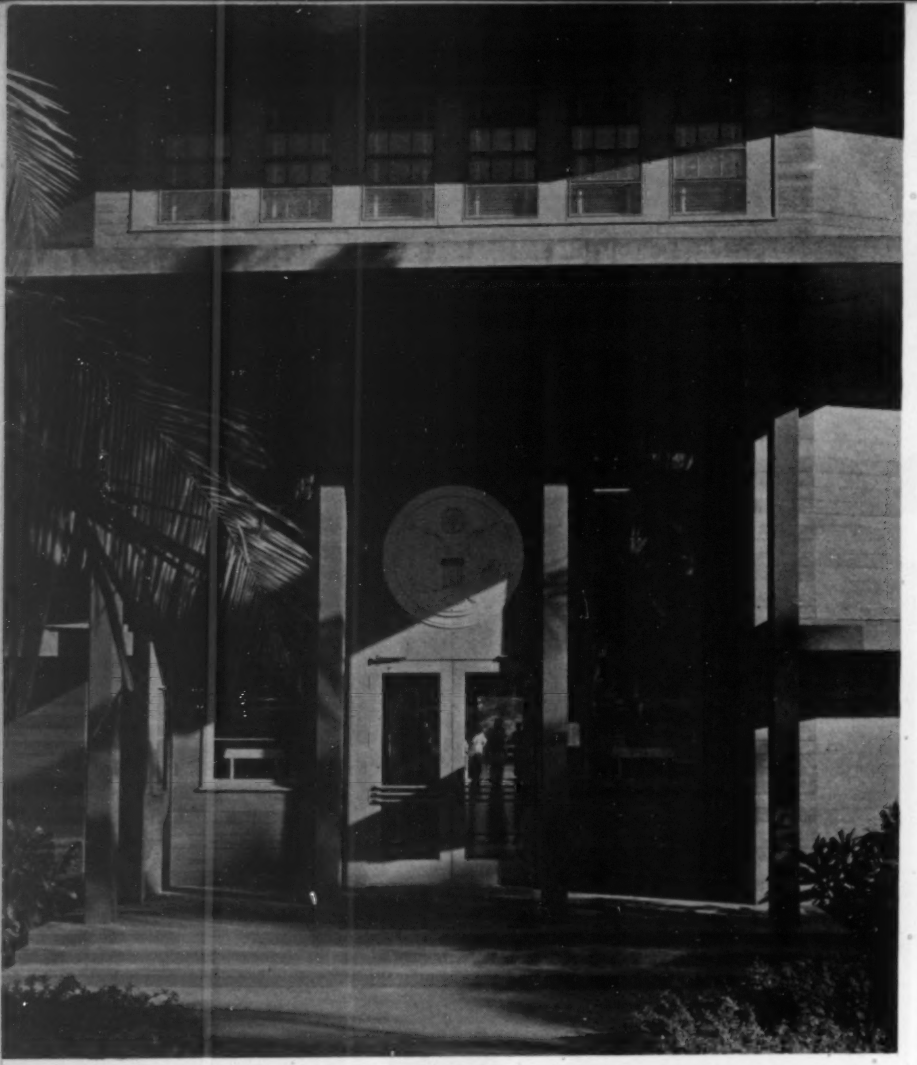


SIGNAL CORPS Photos

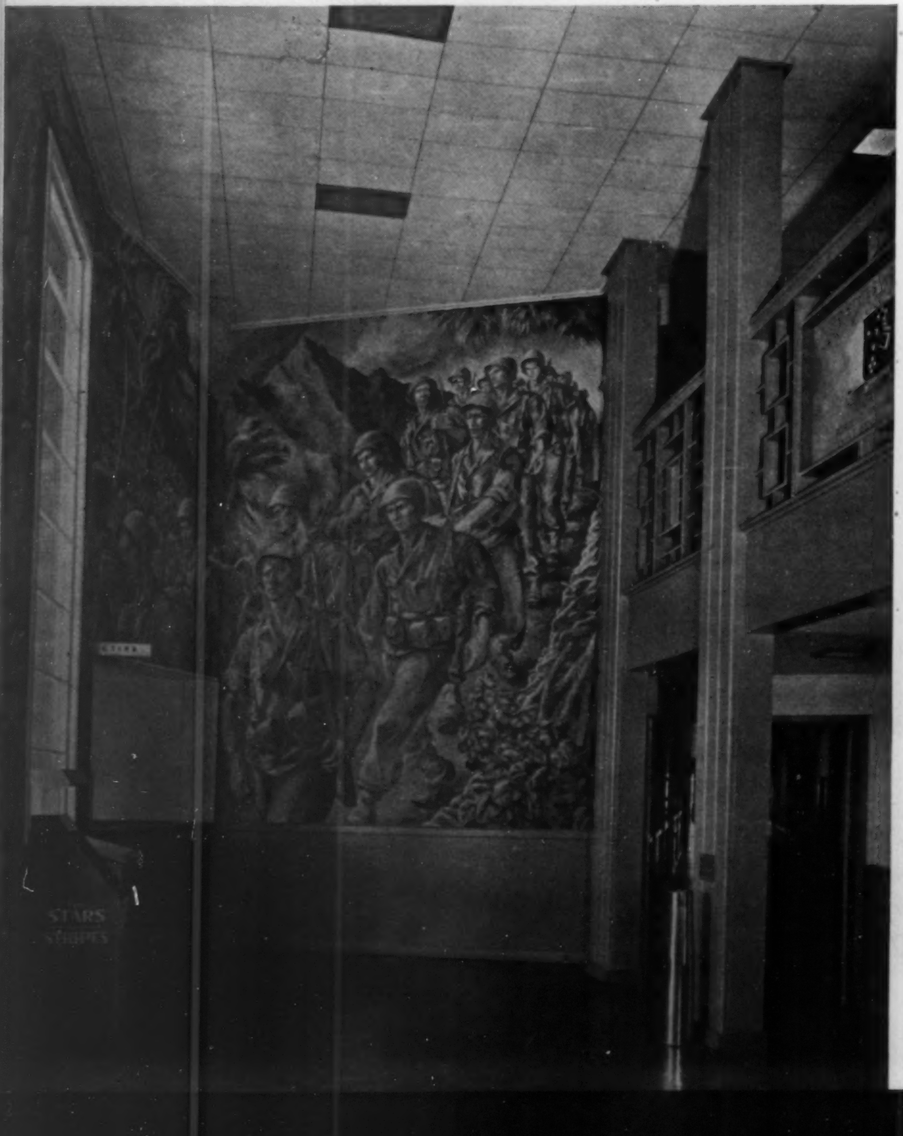


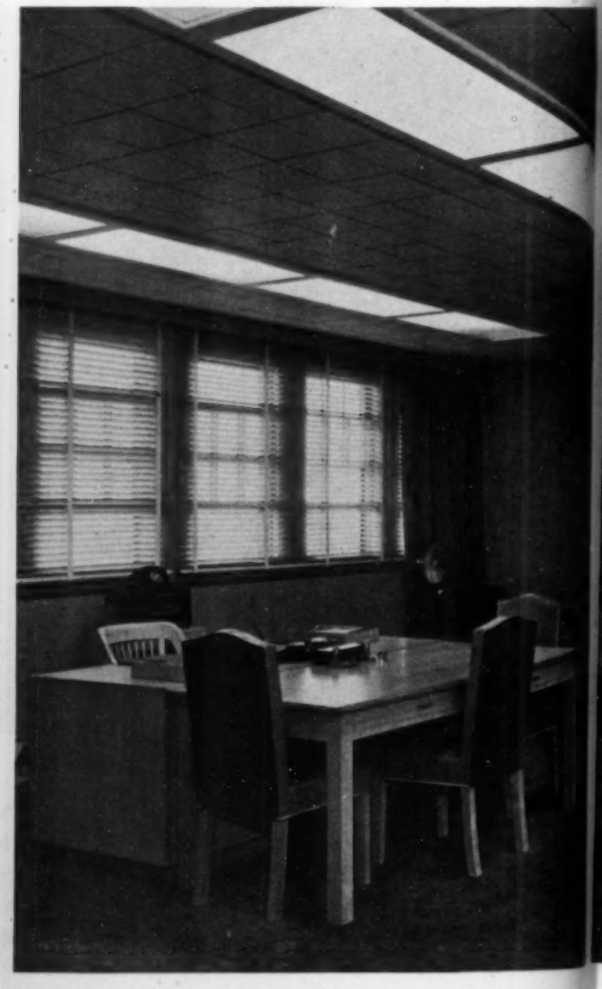


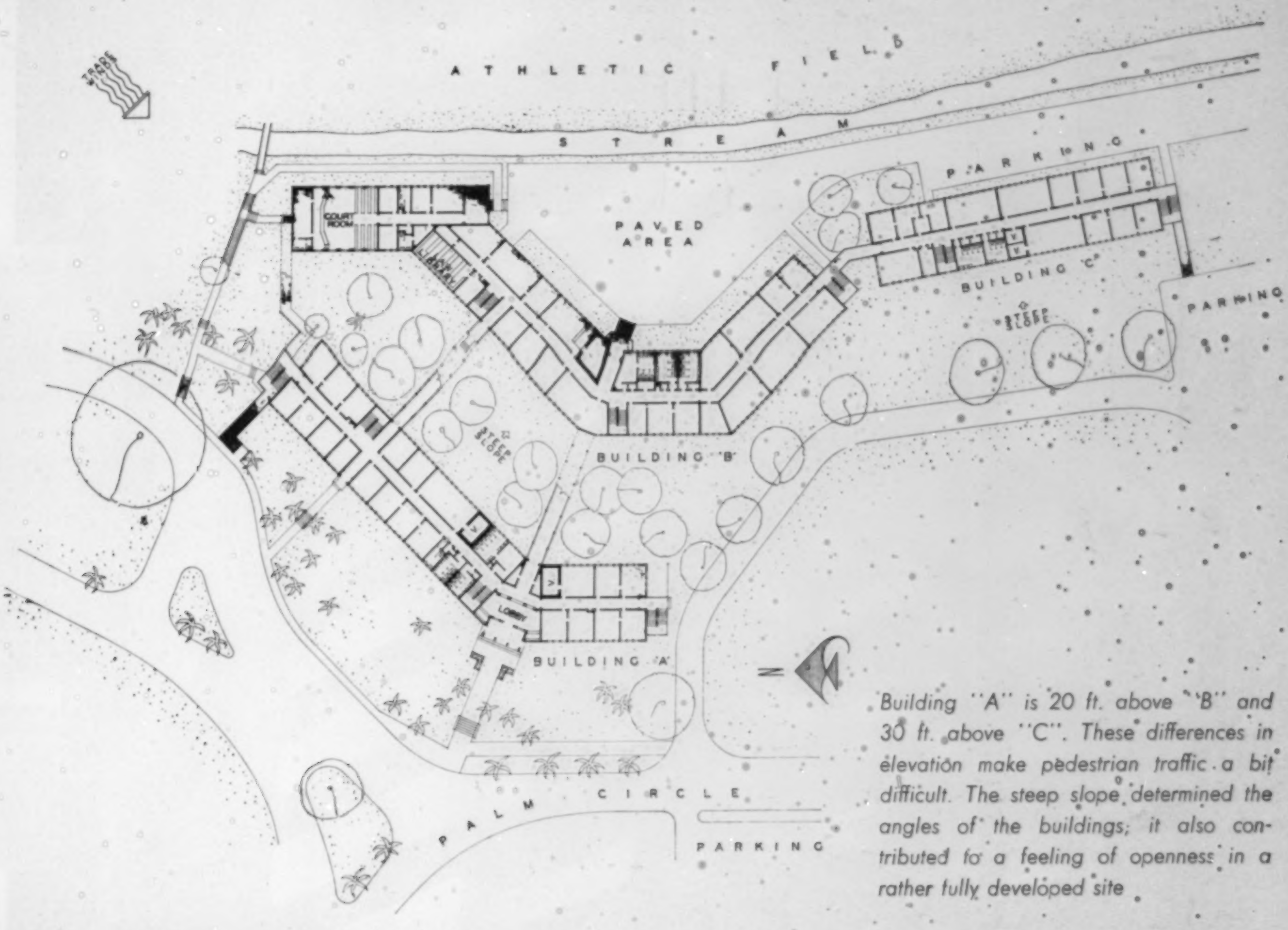
A small bronze plaque in the main lobby gives credits for the building as follows: "Headquarters United States Army Forces Pacific Ocean Area — Lieut. General Robert C. Richardson, Jr., Commanding — This building was Designed and Constructed by the United States Engineer Office, Honolulu, T. H., Under the Direction of Brig. General Herbert B. Loper, C. E.; Colonel B. R. Wimer, C. E. — S. Perliter, Head Engineer; Randall B. Weaver, Supervising Architect; Cole McFarland, Architect; N. M. Gaddis, Architectural Engineer; H. N. Hockensmith, Major C. E., Area Engineer; Harry Berger, Construction Superintendent"



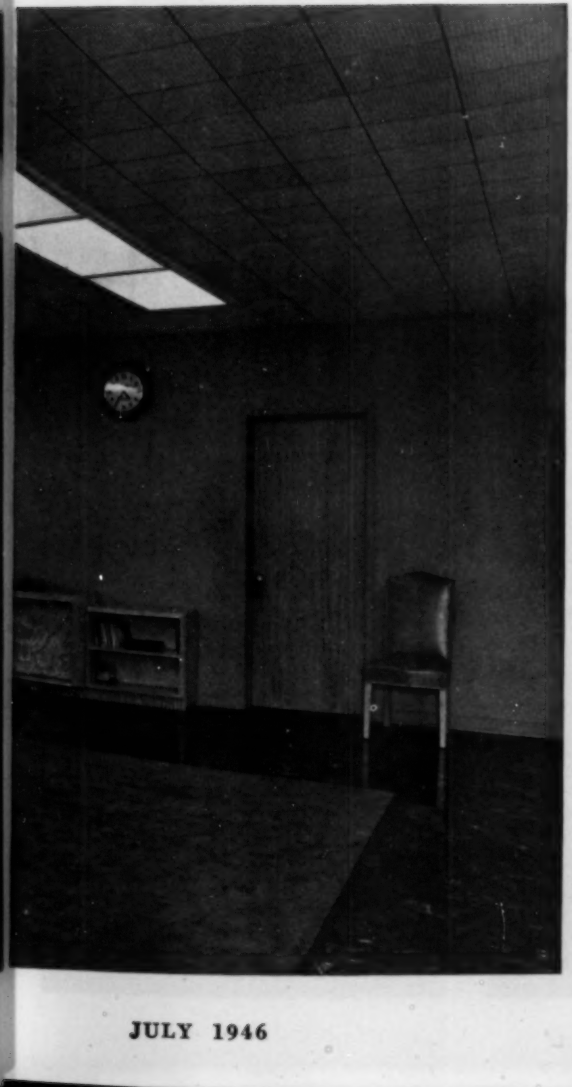
Left: Main entrance to Building "A" has two-story wood columns and recessed lanai. The great seal of the United States is made of built-up plywood finished with aluminum paint. The lobby opens to the main passage to Building "B". Left below: main entrance lobby of Building "A". Fluted columns are painted a rich blue-green. The mural was designed by Master Sergeant William R. Domaratius. Site conditions at the entrance, and the road elevation in front of the building, made it necessary to keep the entrance high to prevent having the building appear to be down in a hole. The lobby floor was therefore raised two steps above the rest of the first floor. Center: this view of the Commanding General's office shows the plywood wall finish, asphalt tile floor and acoustical ceiling. Fluorescent lighting is recessed in a 6-in. furred space in the ceiling; this space is available throughout the building for the complicated communications wiring. Right below: main axis corridor from lobby of Building "A" to third floor balcony of Building "B"





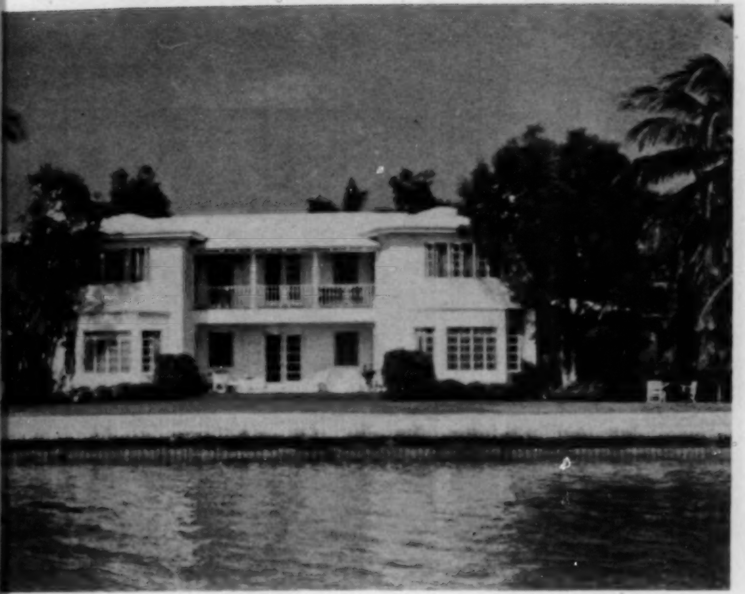

TRADE WINDS
ATHLETIC FIELD
STREAM
PARKING
COURT ROOM
LIBRARY
PAVED AREA
BUILDING 'C'
STEEP SLOPE
PARKING
STEEP SLOPE
BUILDING 'B'
LOBBY
BUILDING 'A'
N
PALM CIRCLE
PARKING

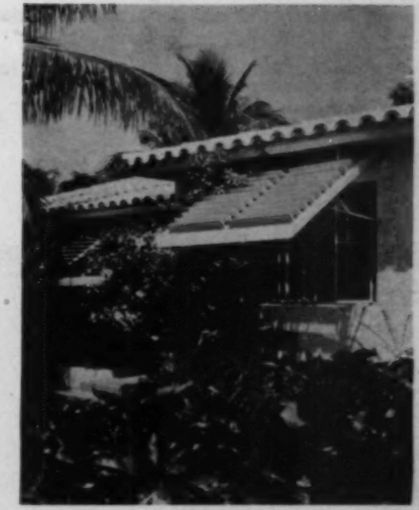
Building "A" is 20 ft. above "B" and 30 ft. above "C". These differences in elevation make pedestrian traffic a bit difficult. The steep slope determined the angles of the buildings; it also contributed to a feeling of openness in a rather fully developed site



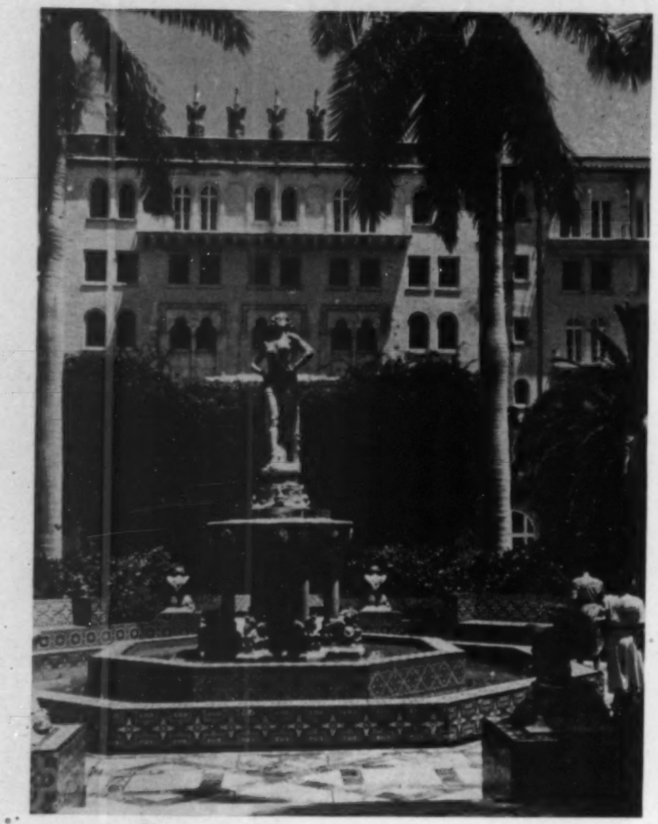
GREENBRIER

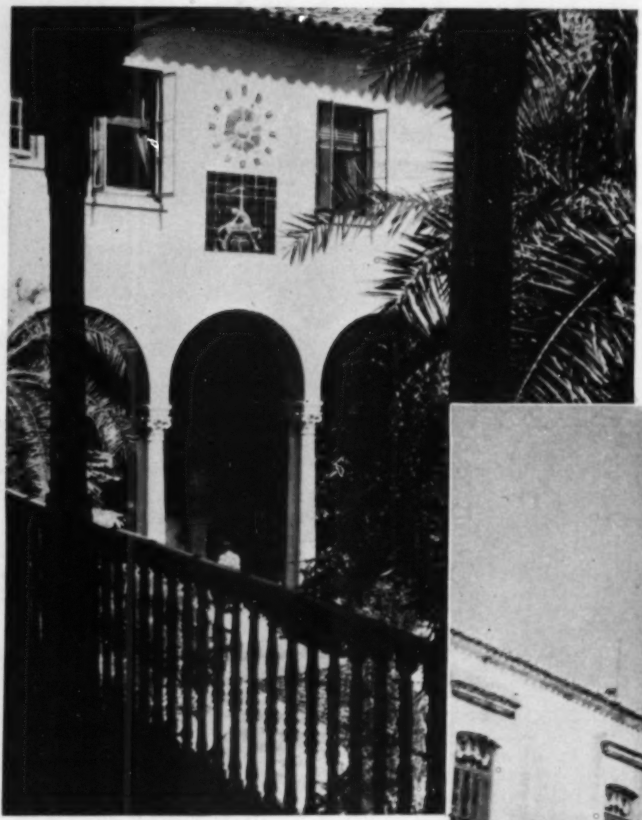
SEEN AT THE A.I.A. CONVENTION



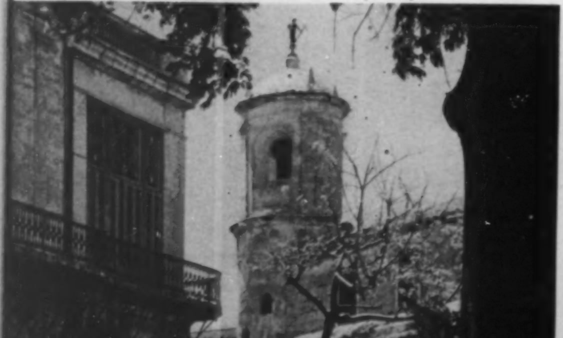


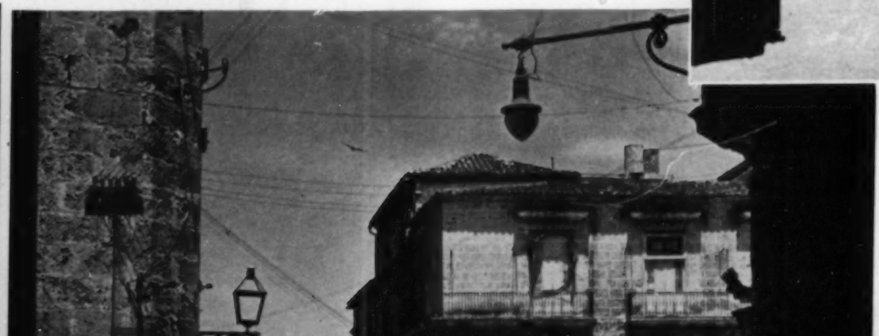
The sawtooth corner plan and balconies of the east side of the Shelbourne Hotel give maximum number of rooms with ocean views. Below, typical smaller hotels, with shading "eyebrows" over windows. Luxurious winter homes make the most of water views from wide windows, screened porches and balconies. Right, a permanent, but adjustable louvered sunshade





Above, left, the entrance court fountain, Boca Raton; right, the patio of the Stotesbury residence, Palm Beach. Below, left, a tower of the Castillo de la Fuerga, begun in 1558 by Hernando de Soto, discoverer of the Mississippi; right, view across the Cathedral Plaza



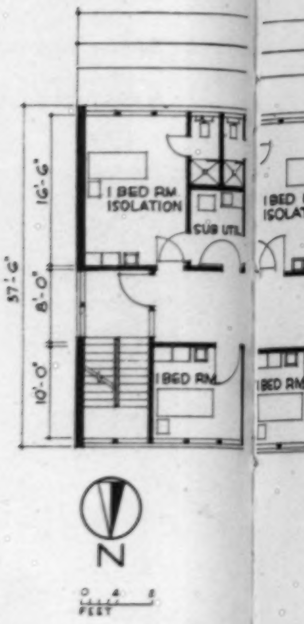


Right, Columbus Cathedral (1656–1724) where traditionally the explorer was buried until removed to Spain after the Spanish-American War. Below, church at Matanzas. Bottom, left, the Presidente Zayas, typical of the narrow streets in the old portion of Havana; right, looking into the Cathedral Square, Havana, from San Ignacio (the building on the right is the "old slave market")

1798

Eugene Karlin

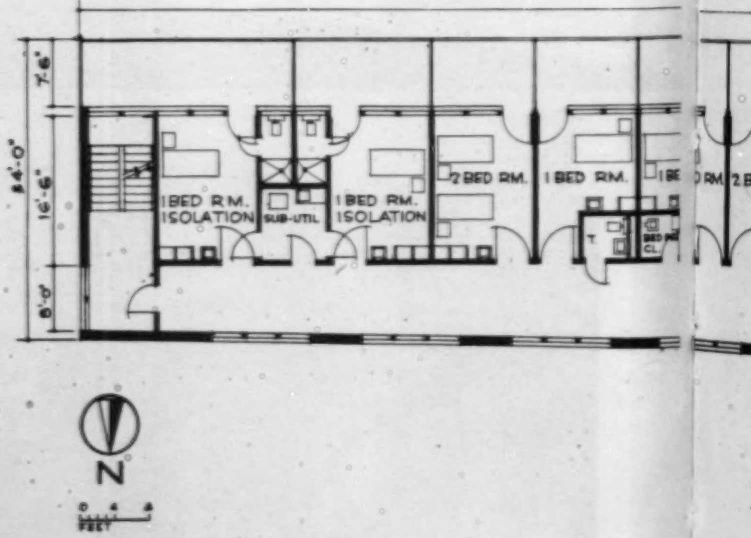
ELEMENTS OF


16'-6"
57'-6"
8'-0"
10'-0"
1 BED RM ISOLATION
SUB UTIL
1 BED RM
1 BED RM ISOLAT
1 BED RM
N
0 4 8
FEET

CONTINUING the series of plans of various elements of the general hospital, prepared by Marshall Shaffer and his staff of hospital architects in the U. S. Public Health Service, we present here the Nursing Department, the Service Department and the Outpatient Department. These complete the plan series. They are, of course, suggestive only, would always have to be adapted to the particular conditions encountered in an individual hospital project. They do, however, incorporate the best practices developed out of innumerable conferences with medical and planning authorities.

Then remains the problem of relationships between these various departments, traffic flows within them and between them, and other similar factors which enter into the integration of the elements and the adaptation of them to the site. Such topics will be the subject of another study next month.

Together the three studies (the first appeared last month) represent a compendium of the studies of hospital design which have occupied the Hospital Facilities Section for several years, and which will continue for architects and hospital administrators.

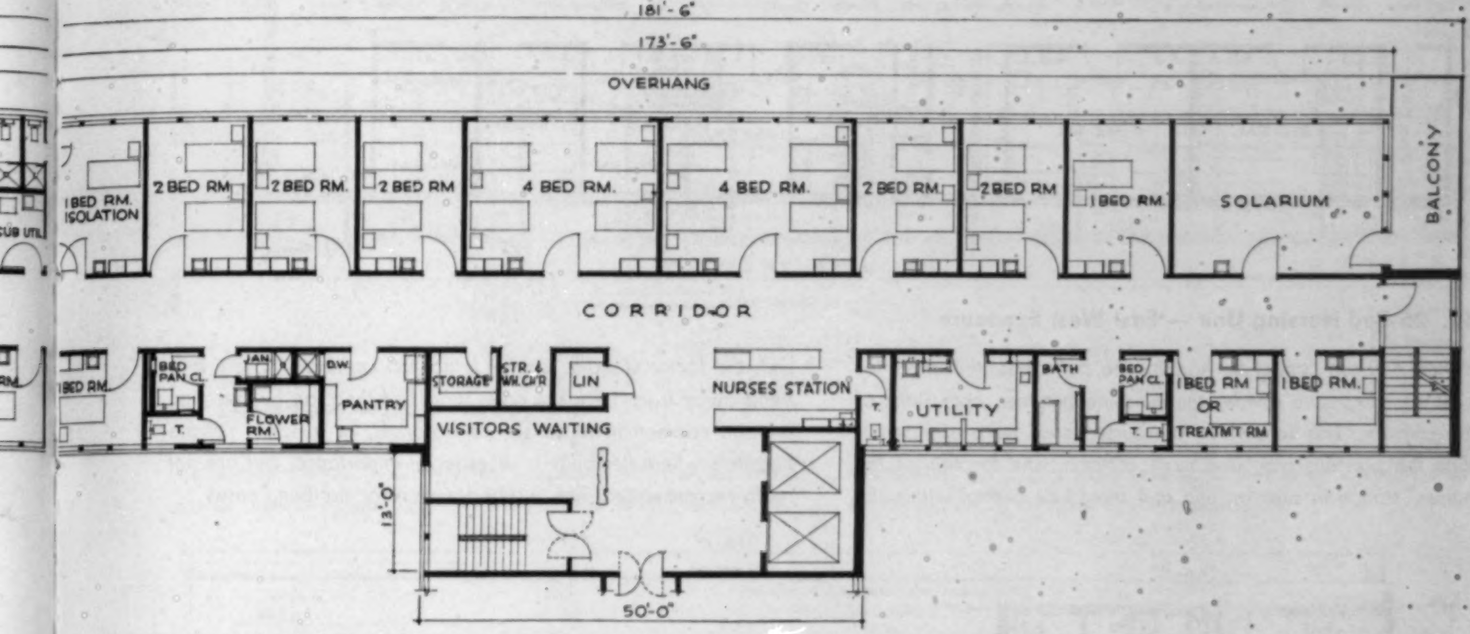

7'-6"
34'-0"
16'-6"
8'-0"
1 BED RM. ISOLATION
SUB-UTIL
1 BED RM. ISOLATION
2 BED RM.
1 BED RM.
T
BED PAN CL.
N
0 4 8
FEET

HOSPITAL FACILITIES SECTION

U. S. PUBLIC HEALTH SERVICE

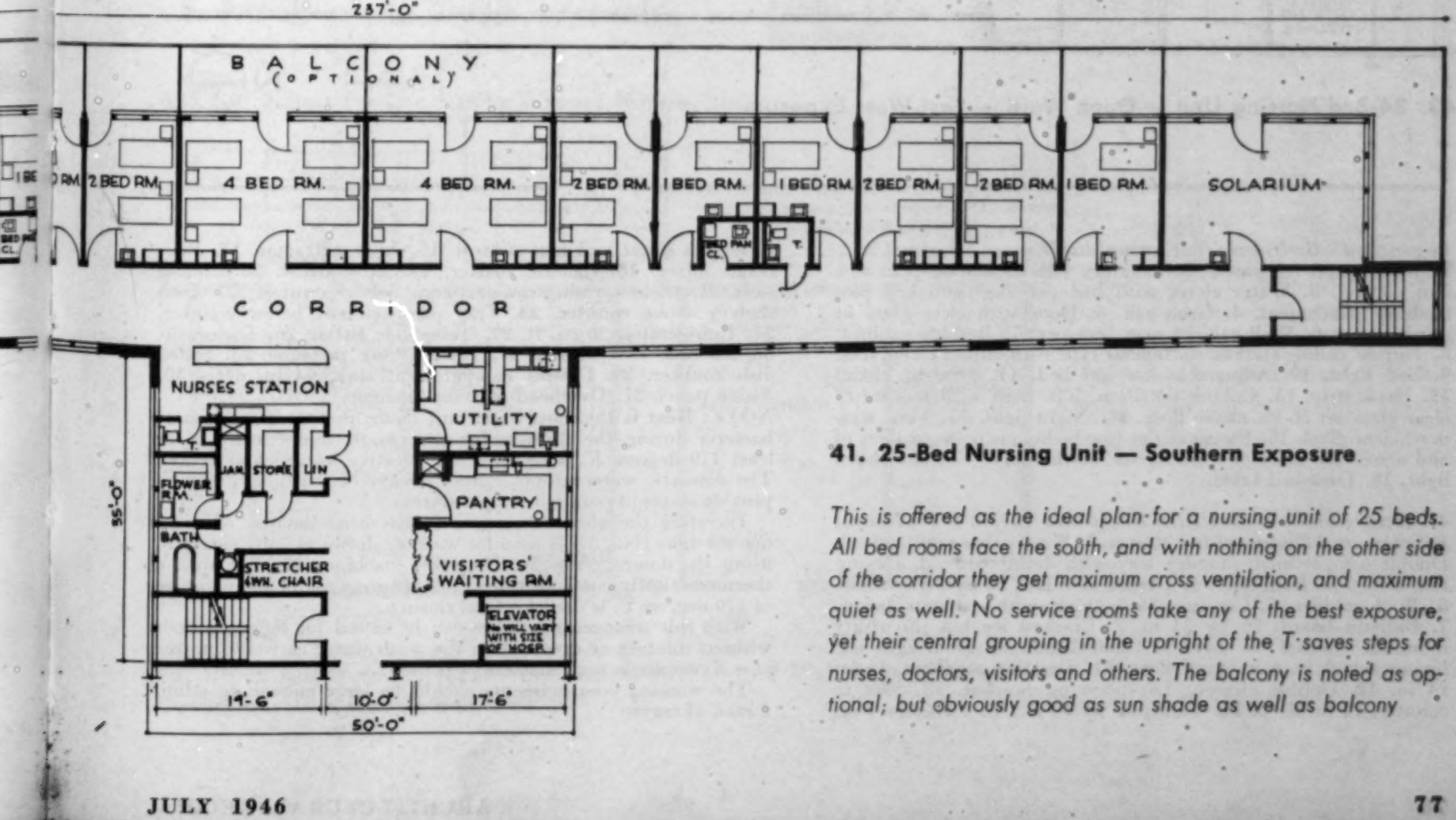
Federal Security Agency

F THE GENERAL HOSPITAL


181'-6"
173'-6"
OVERHANG
BALCONY
1 BED RM. ISOLATION
2 BED RM
2 BED RM.
2 BED RM
4 BED RM.
4 BED RM.
2 BED RM
2 BED RM
1 BED RM.
SOLARIUM
SUB UTIL
CORRIDOR
1 BED RM
BED PAN CL.
T.
JAN
D.W.
FLOWER RM.
PANTRY
STORAGE
STR. & WH.CH'R
LIN
VISITORS WAITING
NURSES STATION
T.
UTILITY
BATH
BED PAN CL.
1 BED RM OR TREATM'T RM
1 BED RM.
T.
13'-0"
50'-0"

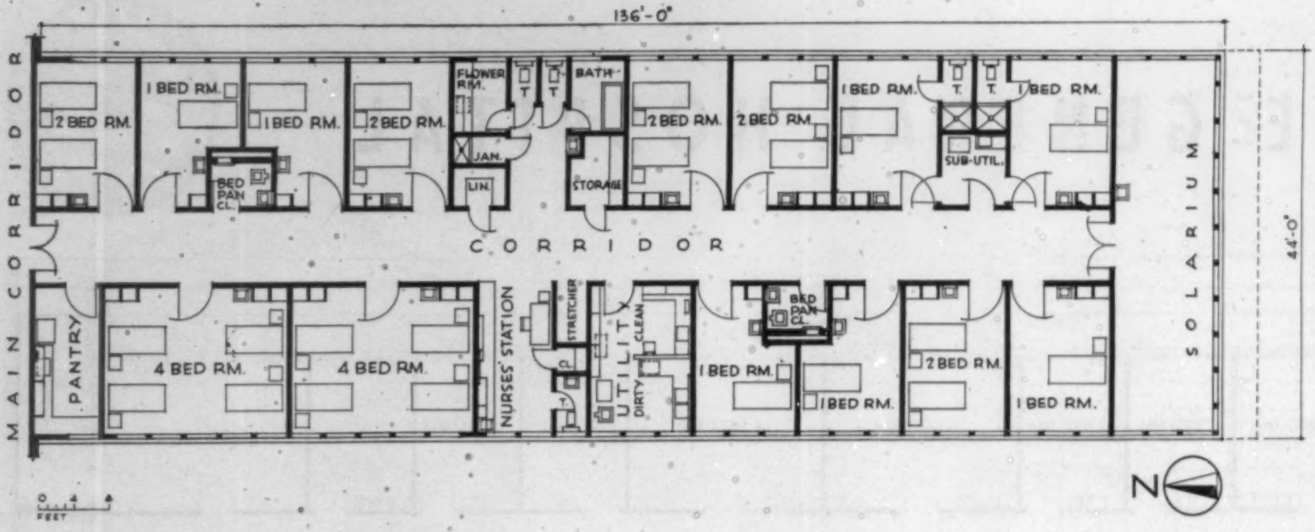
40. 25-Bed Nursing Unit — Southern Exposure with Offset Corridor

The hospital building should be oriented so that nursing units receive the benefit of southern exposure, also prevailing winds and maximum quiet. Ideally the wing should be wide enough, as in the plan below, so that all occupied rooms will have such exposure. This plan, above, represents something of a practical compromise for the sake of economy in land and in building


237'-0"
BALCONY (OPTIONAL)
2 BED RM
4 BED RM.
4 BED RM.
2 BED RM.
1 BED RM.
1 BED RM
2 BED RM
2 BED RM.
1 BED RM.
SOLARIUM
BED PAN CL.
T.
CORRIDOR
NURSES STATION
UTILITY
JAN
STORE
LIN
FLOWER RM.
PANTRY
BATH
STRETCHER & WH. CHAIR
VISITORS' WAITING RM.
ELEVATOR No. WILL VARY WITH SIZE OF HOSP.
55'-0"
14'-6"
10'-0"
17'-6"
50'-0"

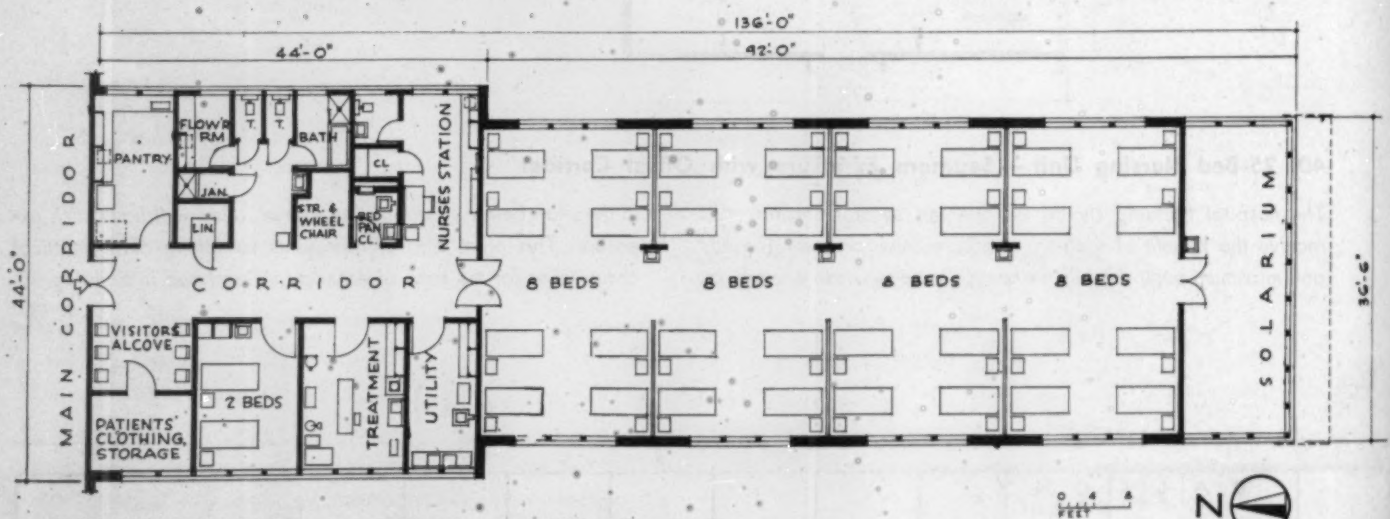
41. 25-Bed Nursing Unit — Southern Exposure

This is offered as the ideal plan for a nursing unit of 25 beds. All bed rooms face the south, and with nothing on the other side of the corridor they get maximum cross ventilation, and maximum quiet as well. No service rooms take any of the best exposure, yet their central grouping in the upright of the T saves steps for nurses, doctors, visitors and others. The balcony is noted as optional; but obviously good as sun shade as well as balcony


136'-0"
MAIN CORRIDOR
2 BED RM.
1 BED RM.
BED PAN CL.
1 BED RM.
2 BED RM.
FLOWER RM.
T.
T.
BATH
JAN.
LIN.
STORAGE
2 BED RM.
2 BED RM.
1 BED RM.
T.
T.
1 BED RM.
SUB-UTIL.
CORRIDOR
SOLARIUM
44'-0"
PANTRY
4 BED RM.
4 BED RM.
NURSES' STATION
STRETCHER
UTILITY
DIRTY
CLEAN
BED PAN CL.
1 BED RM.
1 BED RM.
2 BED RM.
1 BED RM.
N
0 4 8
FEET

42. 25-Bed Nursing Unit — East-West Exposure

Where full sun cannot be had for the bedrooms, this plan for east-west exposure divides the sunshine between both sides of the corridor. This scheme is, of course, much more economical than the previous one, and more common. The location of the nurses' station in such an end unit should be central within the unit; the factor of traffic control is not too important. There is a trend away from the large open wards of the plan below; they are still common in large service hospitals, or in large private hospitals where flexibility is of especial importance, but are not really recommended. The two-bed room is for moribund cases


136'-0"
44'-0"
92'-0"
MAIN CORRIDOR
PANTRY
FLOW'R RM.
T.
T.
BATH
JAN.
LIN.
STR. & WHEEL CHAIR
CL.
BED PAN CL.
NURSES STATION
CORRIDOR
44'-0"
8 BEDS
8 BEDS
8 BEDS
8 BEDS
SOLARIUM
36'-6"
VISITORS ALCOVE
PATIENTS' CLOTHING STORAGE
2 BEDS
TREATMENT
UTILITY
0 4 8
FEET
N

43. 34-Bed Nursing Unit — Open Ward — East-West Exposure

Legends: 45. Bedrooms for Contagious Disease Nursing Unit. 1. Waste paper receptacle. 2. Lavatory with gooseneck spout and foot control. 3. Water closet with bed pan lugs and bed pan flushing attachment. 4. Grab rail. 5. Door with clear glass in upper panel. 6. Wall cabinet over lavatory. 7. Bedside cabinet. 8. Nurses' calling station, contagious type with duplex receptacle. 9. Bed light. 10. Adjustable hospital bed. 11. Straight chair. 12. Hook strip. 13. Cubicle partition, 7 ft. high with bottom of clear glass set 36 in. above floor. 14. Night light. 15. View window, clear glass. 16. Steam outlet (for bedrooms on both sides of and across the corridor from nurses' station). 17. Corridor dome light. 18. Over-bed table.

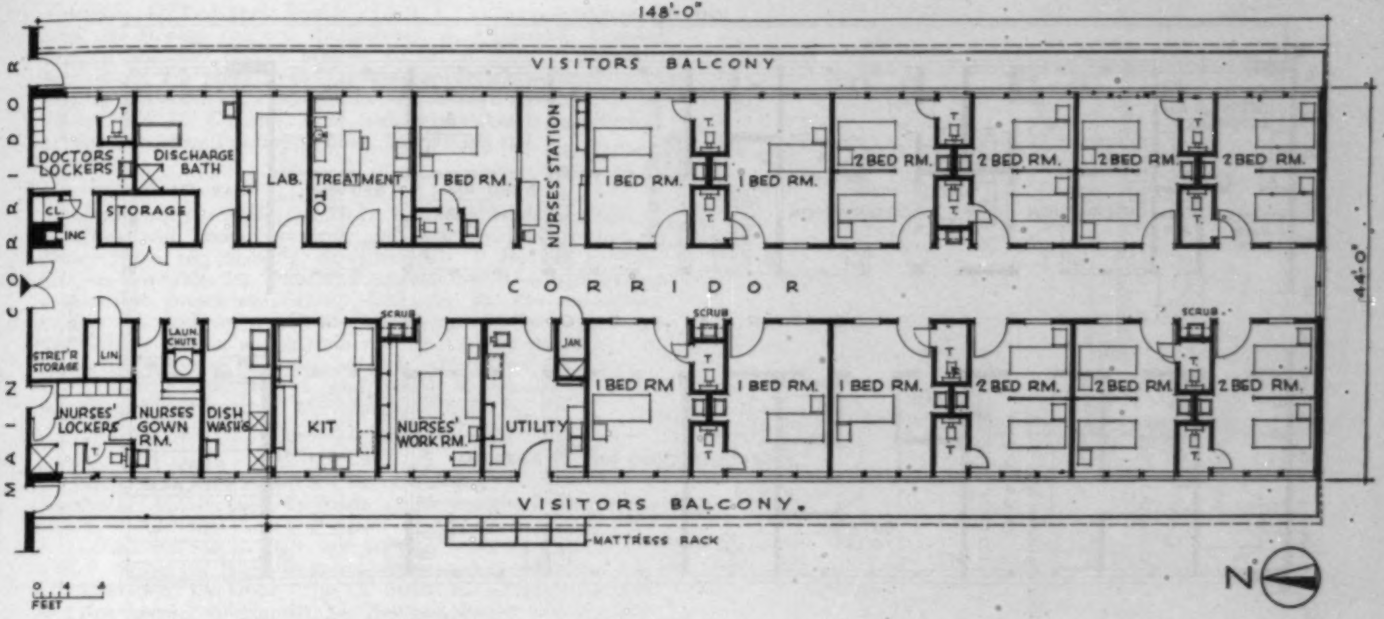
46. Contagious Disease Utility Room and Nurses' Work Room, Kitchen and Dishwashing Room. 1. Wastepaper receptacle. 2. Double compartment laundry tray with drainboards. 3. Drying rod, 5 ft. 6 in. from floor. 4. Utensil sterilizer, 20 by 20 by 24 in. 5. Wall cabinet. 6. Counter, 36 in. high, with cabinets below. 7. Bulletin board, 26 by 24 in. 8. Cracked ice bin (in utility room, for external use only). 9. Clinical sink. 10. Domelight and buzzer set, 5 ft. 6 in. from floor. 11. Dressing sterilizer, 16 by 24 in. 12. Double element hot plate on bracket. 13. Sink in counter, 14 in. deep. 14. Table, 30 by 60 in. 15. Lavatory with gooseneck spout and foot control. 16. Juice extractor. 17. Beverage mixer. 18. Electric toaster. 19. Tray truck. 20. Sliding sash. 21. Dish warming compartment below counter. 22. Open shelves above counter. 23. Tray compartment below counter. 24. Refrigerator, 20 cu. ft. 25. Telephone outlet. 26. Dishwashing machine with heater. 27. Dishwashing machine. 28. Soiled dish counter. 29. Double compartment sink, 14 in. deep. 30. Vision panel. 31. Overhead plug for food cart.

NOTE: Heat is the most important factor in the destruction of bacteria during the dishwashing process. A temperature of at least 170 degrees F. is required for effective bactericidal action. The domestic water supply cannot always be depended upon to provide water of required temperature.

Therefore the above arrangement has been devised whereby one machine (No. 27) is used for washing dishes at 140 degrees F. using the domestic supply. The other machine (No. 26), with a thermostatically controlled heater to insure a water temperature of 170 degrees F. is used for final rinsing.

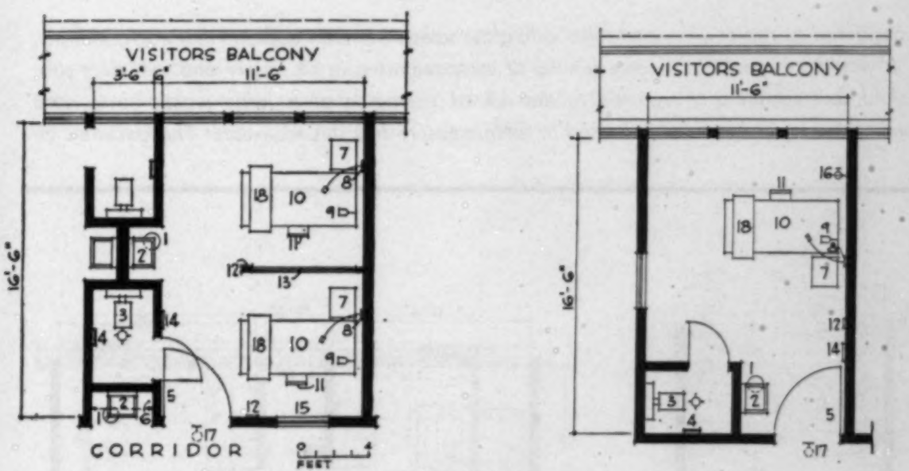
With this arrangement dishes can be rinsed for longer periods without diluting or overheating the wash water as would be the case if one single tank machine was used.

The washing compartments should be large enough to admit a rack of trays.


148'-0"
44'-0"
VISITORS BALCONY
MAIN CORRIDOR
DOCTORS LOCKERS
DISCHARGE BATH
CL.
INC
STORAGE
LAB.
TREATMENT
TO
1 BED RM.
NURSES' STATION
1 BED RM.
1 BED RM.
2 BED RM.
2 BED RM.
2 BED RM.
2 BED RM.
T.
CORRIDOR
STRET'R STORAGE
LIN
LAUN. CHUTE
NURSES' LOCKERS
NURSES GOWN RM.
DISH WASH'G
KIT
SCRUB
NURSES' WORK RM.
UTILITY
JAN
1 BED RM
1 BED RM.
1 BED RM.
2 BED RM.
2 BED RM.
2 BED RM.
VISITORS BALCONY.
MATTRESS RACK
FEET
N

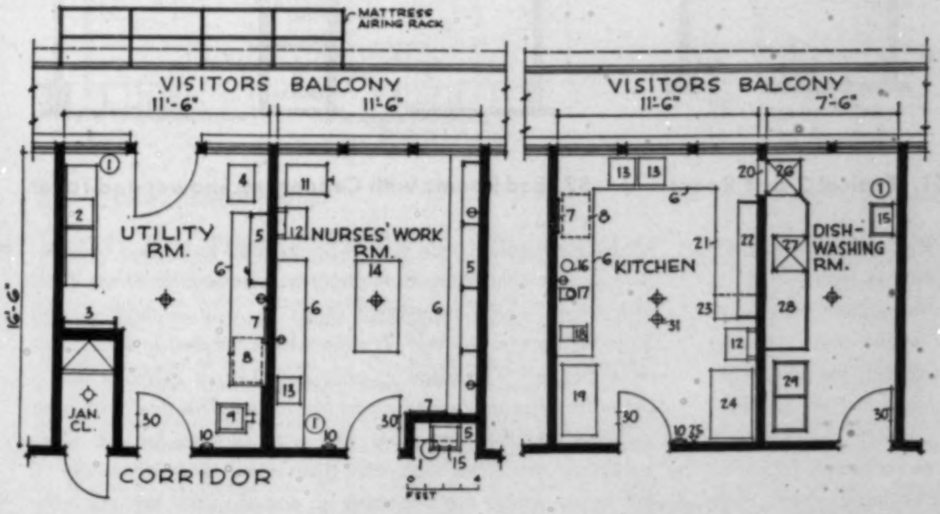
44. Contagious Disease Nursing Unit

The outside visitors' balcony is an interesting trick for the contagious disease rooms; naturally it keeps the visitors out of the corridor, which is of course necessary; it is also uncomfortable for the visitors, a fact that has its advantages


VISITORS BALCONY
3'-6"
6"
11'-6"
16'-6"
CORRIDOR
FEET
VISITORS BALCONY
11'-6"
16'-6"

Always the visitor must be kept out of the bed rooms in the contagious disease department; nurses should enter as seldom as possible. The visitors are kept on the balcony; the nurses have a view window in the corridor wall (the dividing partition in the two-bed room is of glass) and often don't need to enter

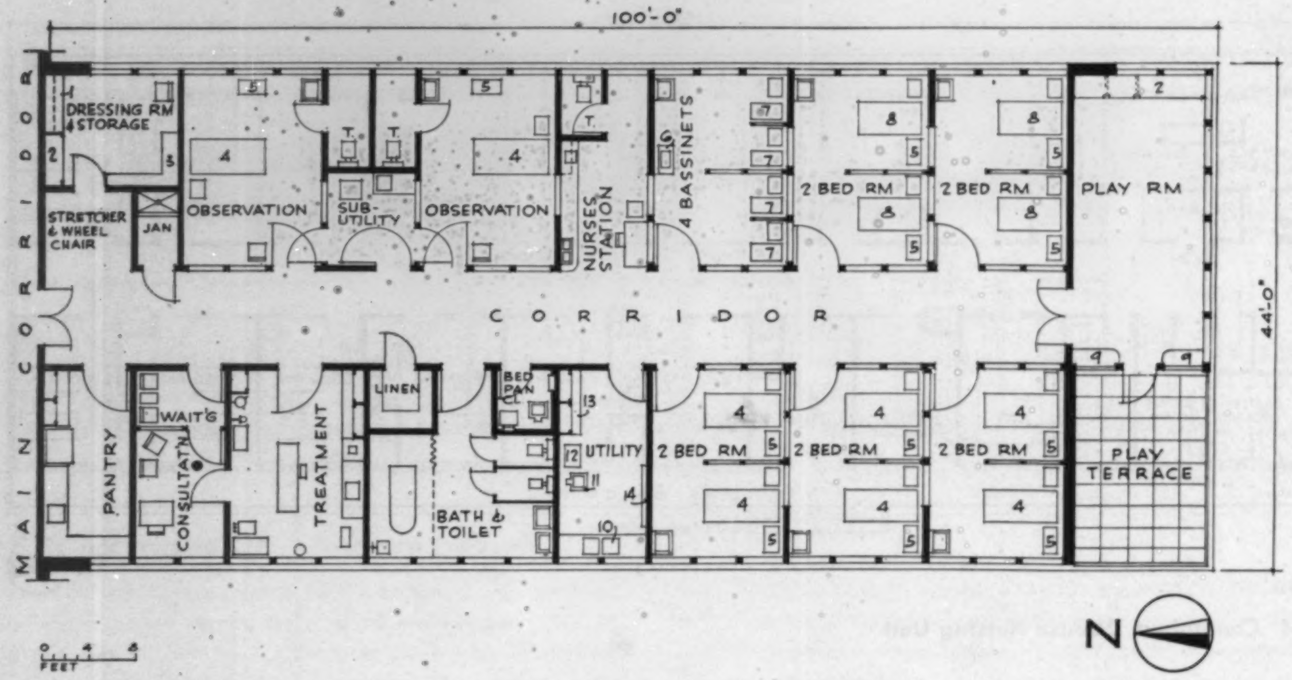
45. Bed Rooms for Contagious Disease Nursing Unit


MATTRESS AIRING RACK
VISITORS BALCONY
11'-6"
11'-6"
16'-6"
UTILITY RM.
NURSES' WORK RM.
JAN. CL.
CORRIDOR
FEET
VISITORS BALCONY
11'-6"
7'-6"
KITCHEN
DISH-WASHING RM.

The contagious disease rooms must also be isolated from the rest of the hospital as far as food and other services are concerned. And dishwashing is an especial problem because of the need for sterilization of everything. Actually dishes get double washing, once at 140°, once at 170°.

46. Utility Room and Nurses' Work Room, Kitchen and Dishwashing Room for Contagious Disease Nursing Unit

PEDIATRIC NURSING UNITS


100'-0"
44'-0"
MAIN CORRIDOR
DRESSING RM & STORAGE
STRETCHER & WHEEL CHAIR
JAN
OBSERVATION
SUB-UTILITY
OBSERVATION
NURSES STATION
4 BASSINETS
2 BED RM
2 BED RM
PLAY RM
CORRIDOR
PANTRY
WAIT'G
CONSULTAT'N
TREATMENT
LINEN
BATH & TOILET
BED PAN CL
UTILITY
2 BED RM
2 BED RM
2 BED RM
PLAY TERRACE
N
FEET

47. Pediatric Nursing Unit

In the pediatric nursing unit every child is considered to represent a potential case of contagious disease. It would be ideal, therefore, to have a single room for each child, but complete isolation is not good psychologically. The compromise is a two-bed room with glass screen between beds, so that each child has some feeling of companionship in his misery and yet is not subjected to the risk of contagion of a large ward; he is even protected in some measure from his roommate. The bassinets in-

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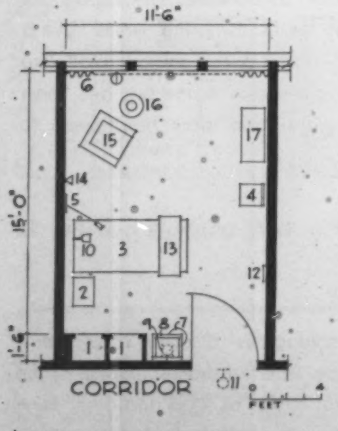
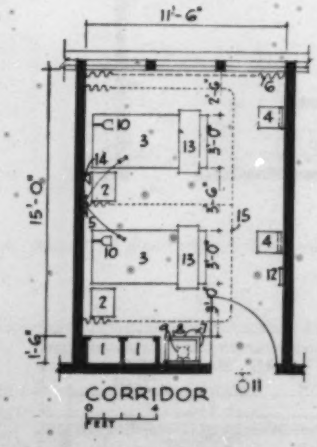
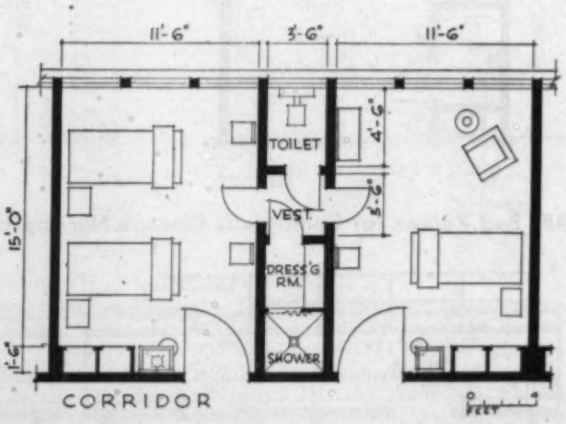
TYPICAL BED ROOMS


11'-6"
15'-0"
1'-6"
CORRIDOR
FEET

50. Typical 1-Bed Room


11'-6"
15'-0"
1'-6"
CORRIDOR
FEET

51. Typical 2-Bed Room


11'-6"
3'-6"
11'-6"
15'-0"
1'-6"
TOILET
VEST
DRESS'G RM.
SHOWER
CORRIDOR
FEET

52. Bed Rooms with Connecting Shower and Toilet

The typical bed rooms are based on the "Rigs" plan, developed abroad, in which the beds parallel the outside wall, which is considered the best position since it gives the patient the choice of looking toward the light or away from it. The one- and two-bed rooms of course are alike, the one becoming the other with but minor changes in furnishings. The scheme in Plan 52 illustrates what amounts to a trend toward connecting toilets and shower baths. This arrangement might be called a practical compromise between having no baths and having a private bath for each room. The private bath is an attractive feature to the patient, who usually does not stop to realize that it probably will not be very useful, since he will be confined to his bed anyway. Perhaps the connecting bath might give something of the hotel atmosphere which the patient seems to want, without adding quite so much to the cost. For the wards the unit in Plan 53 is recommended. The large ward is not liked; a four-bed unit is about as large as the physicians like to see. This one, with beds arranged on the Rigs plan, and with curtains for use when necessary, works out well, and gives some sense of privacy. If the larger wards are necessary — and they still are not infrequently — the scheme in Plan 54, which combines two four-bed wards, seeks to carry out the advantages of the former scheme

Legends: 47. Pediatric Nursing Unit. **1. Clothes pole with shelf over. 2. Storage cabinet. 3. Shelving. 4. Adjustable hospital bed. 5. Toy and clothes cabinet. 6. Infant scale. 7. Bassinet. 8. Crib. 9. Toy shelves. 10. Double compartment laundry tray and drainboards. 11. Clinical sink. 12. Utensil sterilizer, 20 by 20 by 24 in. 13. Counter, 36 in. high, with cabinets and cracked ice bin below; wall cabinets above. 14. Drying rod.**

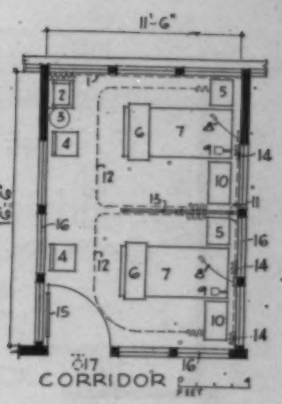
48. Bedroom for Pediatric Unit. **1. Sliding window curtain. 2. Lavatory with gooseneck spout and knee or elbow control. 3. Waste paper receptacle. 4. Straight chair. 5. Bedside cabinet. 6. Over-bed table. 7*. Adjustable hospital bed. 8. Nurses' calling station with duplex receptacle. 9. Bed light. 10. Toy and clothes cabinet. 11. Indirect wall fixture above top of cubicle partition. 12. Cubicle curtain and curtain rod. 13. Cubicle partition, 7 ft. high with bottom of clear glass set 36 in. above floor. 14. Curtain. 15. Door with clear glass in upper panel. 16. Clear glass beginning 36 in. above floor. 17. Corridor dome light.**

49. Bathroom for Pediatric Unit. **1. Lavatory — junior size. 2. Lavatory — adult size. 3. Waste paper receptacle. 4. Water closet — junior size. 5. Water closet — adult size. 6. Adult scale. 7. Curtain and rod. 8. Bath tub, pedestal type, with controls on wall. 9. Steps. 10. Dome light and buzzer set 5 ft. 6 in. from floor. 11. Towel bar. 12. Hook strip. 13. Stool. 14. Clinical sink with bed pan flushing attachment. 15. Bed pan washer and sterilizer. 16. Recessed cabinet. 17. Table, 16 by 20 in. 18. Bulletin board, 26 by 24 in. 19. Vision panel. 20. Shelving. 21. Obscure glass.**

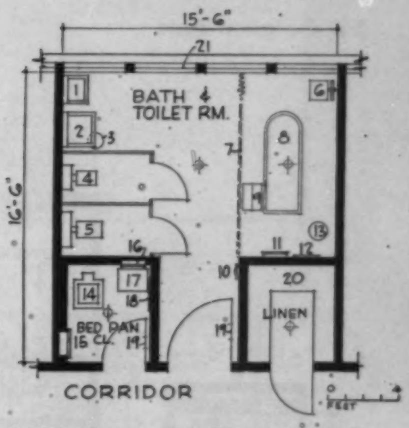
NOTE: Five patient rooms may be added to this unit with no additional service rooms.

*** Cribs may be substituted as required.**

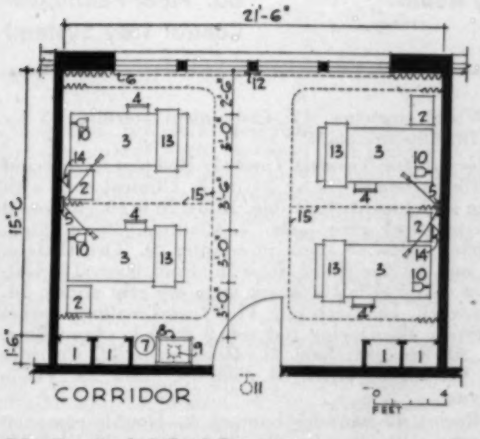
dicated on the plan are for infants not born in the hospital, and therefore not permitted in the regular nurseries. With the same facilities shown for this pediatric suite it would be possible to serve more beds than indicated here — up to 20.



48. Bed Room for Pediatric Unit



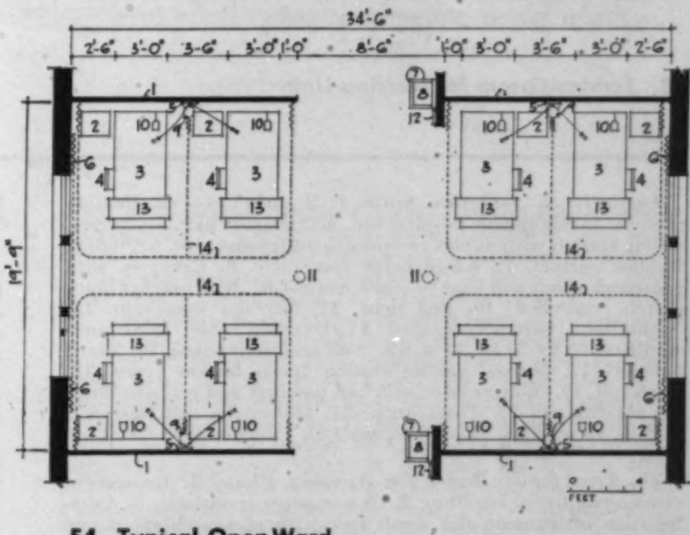
49. Bathroom for Pediatric Unit



53. Typical 4-Bed Room

Legends: 50. Typical One-Bed Room. **1. Built-in locker. 2. Bedside cabinet. 3. Adjustable hospital bed. 4. Straight chair. 5. Nurses' calling station with duplex receptacle. 6. Sliding window curtain. 7. Waste paper receptacle. 8. Lavatory with gooseneck spout and knee or elbow control. 9. Wall bracket light, switch controlled. 10. Bed light. 11. Corridor dome light. 12. Night light, switch controlled. 13. Over-bed table. 14. Telephone outlet. 15. Easy chair. 16. Floor lamp. 17. Dresser.**

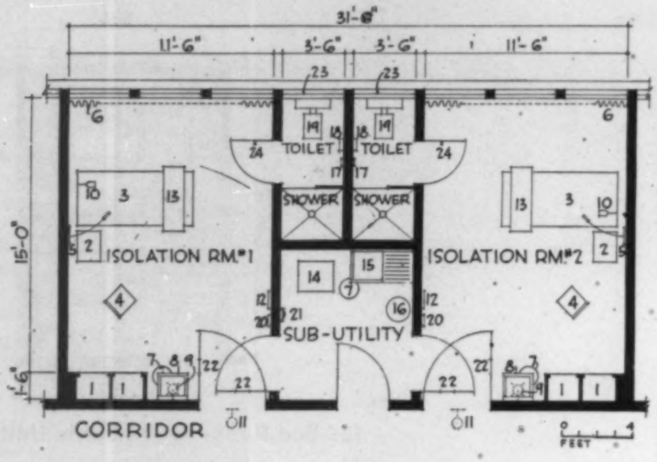
51. Typical Two-Bed Room. **1. Built-in locker. 2. Bedside cabinet. 3. Adjustable hospital bed. 4. Straight chair. 5. Nurses' calling station with duplex receptacle. 6. Sliding window curtain. 7. Waste paper receptacle. 8. Lavatory with gooseneck spout and knee or elbow control. 9. Wall bracket light, switch controlled. 10. Bed light. 11. Corridor dome light. 12. Night light, switch controlled. 13. Over-bed table. 14. Telephone outlet. 15. Cubicle rod and curtain.**



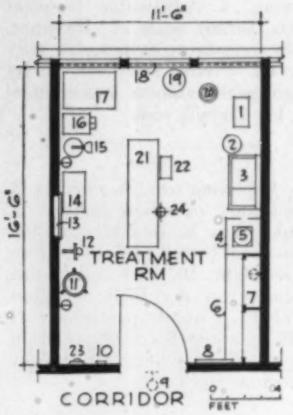
54. Typical Open Ward

53. Typical Four-Bed Room. **1. Built-in locker. 2. Bedside cabinet. 3. Adjustable hospital bed. 4. Straight chair. 5. Nurses' calling station with duplex receptacle. 6. Sliding window curtain. 7. Waste paper receptacle. 8. Lavatory with gooseneck spout and knee or elbow control. 9. Wall bracket light, switch controlled. 10. Bed light. 11. Corridor dome light. 12. Night light, switch controlled. 13. Over-bed table. 14. Telephone outlet. 15. Curtain rod and curtain.**

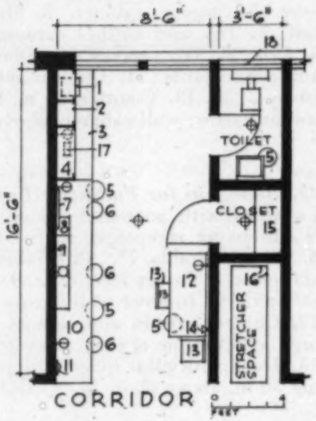
54. Typical Open Ward. **1. Partition, 7 ft. 6 in. high. 2. Bedside cabinet. 3. Adjustable hospital bed. 4. Straight chair. 5. Nurses' calling station with duplex receptacle. 6. Sliding window curtain. 7. Waste paper receptacle. 8. Lavatory with gooseneck spout and knee or elbow control. 9. Indirect fixture at top of partition, switch controlled. 10. Bed light. 11. Ceiling dome light. 12. Night light, switch controlled. 13. Over-bed table. 14. Cubicle curtain and rod.**



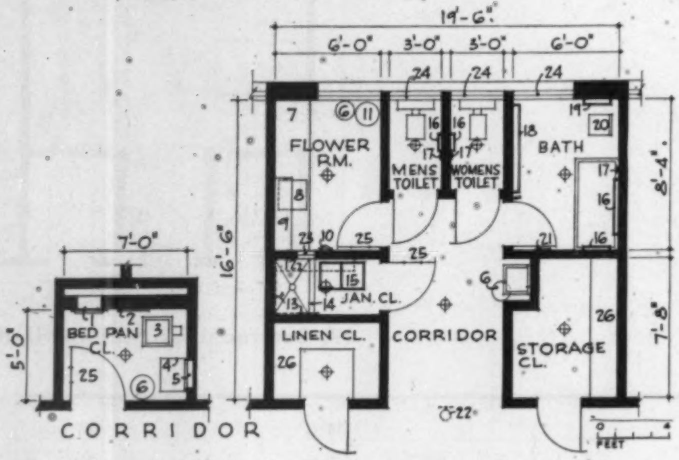
55. Isolation Suite



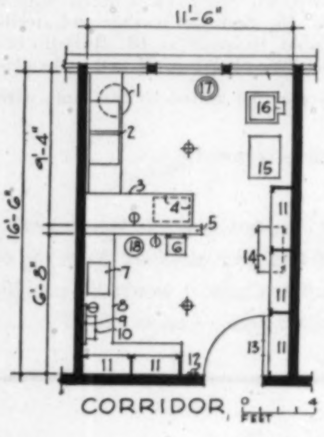
56. Treatment Room for Nursing Floor



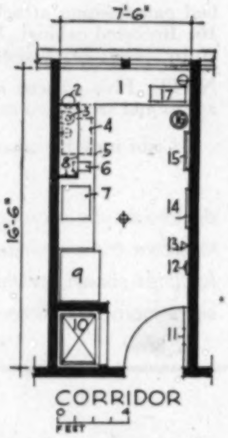
57. Nurses' Station and Stretcher Space



58. Service Group for Nursing Unit



59. Utility Room



60. Floor Pantry (for Central Tray System)

Legends: 55. Isolation Suite. **1.** Built-in locker. **2.** Bedside cabinet. **3.** Adjustable hospital bed. **4.** Straight chair. **5.** Nurses' calling station with duplex receptacle, contagious type. **6.** Sliding window curtain. **7.** Waste paper receptacle. **8.** Lavatory with gooseneck spout and knee or elbow control. **9.** Wall bracket light, switch controlled. **10.** Bed light. **11.** Corridor domelight. **12.** Night light, switch controlled. **13.** Overbed table. **14.** Utensil sterilizer, 20 by 20 by 24 in. **15.** Sink and drainboard. **16.** Linen hamper. **17.** Nurses' calling station (push button type). **18.** Grab rail. **19.** Water closet with bed pan lugs and bed pan flushing attachment. **20.** Hook strip. **21.** Domelight and buzzer, 5 ft. 6 in. above floor. **22.** View panel. **23.** Obscure glass. **24.** Coat hook.

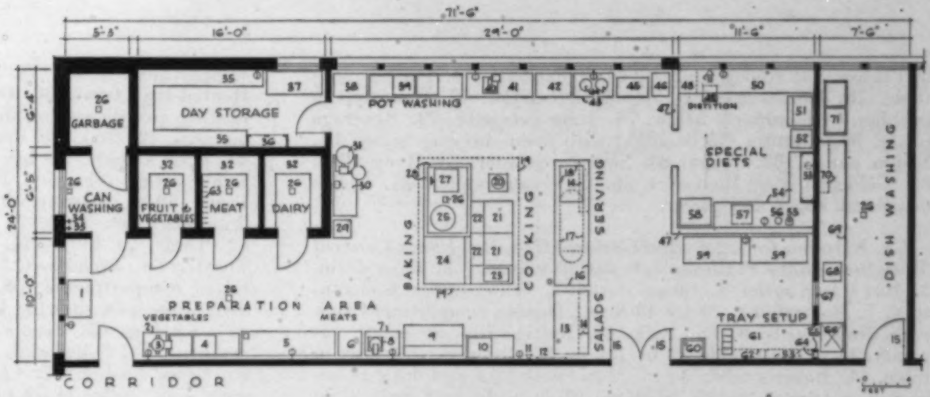
56. Treatment Room for Nursing Floor. **1.** Instrument sterilizer, 9 by 10 by 20 in. **2.** Waste paper receptacle. **3.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **4.** Counter, 29 in. high, open below. **5.** Single element hot plate. **6.** Counter, 36 in. high, with cabinets below. **7.** Wall cabinet. **8.** Bulletin board, 26 by 24 in. **9.** Corridor domelight. **10.** Nurses' call (connected to nurses' station). **11.** Kick bucket. **12.** Irrigator stand. **13.** Double recessed view box. **14.** Dressing cart. **15.** Examining light. **16.** Mayo table. **17.** Instrument table, 24 by 36 in. **18.** Lightproof shades. **19.** Adjustable stool. **20.** Sanitary waste receptacle. **21.** Examining table. **22.** Footstool. **23.** Domelight and buzzer set 5 ft. 6 in. from floor. **24.** Ceiling fixture.

57. Nurses' Station and Stretcher Space. **1.** Medicine sink in counter with gooseneck spout. **2.** Locked wall cabinet with inner locked narcotic compartment and inside light. **3.** Counter, 36 in. high, with cabinets below. **4.** Wall cabinet. **5.** Waste paper receptacle. **6.** Stool. **7.** Bulletin board, 26 by 24 in. **8.** Pigeonhole form rack. **9.** Chart rack. **10.** Counter, 30 in. high, open below. **11.** Domelight and buzzer set, 5 ft. 6 in. from floor. **12.** Nurses' desk. **13.** Straight chair. **14.** Telephone outlet. **15.** Shelving. **16.** Wheel stretcher. **17.** Instrument sterilizer, 3 by 3⅝ by 8½ in. **18.** Obscure glass.

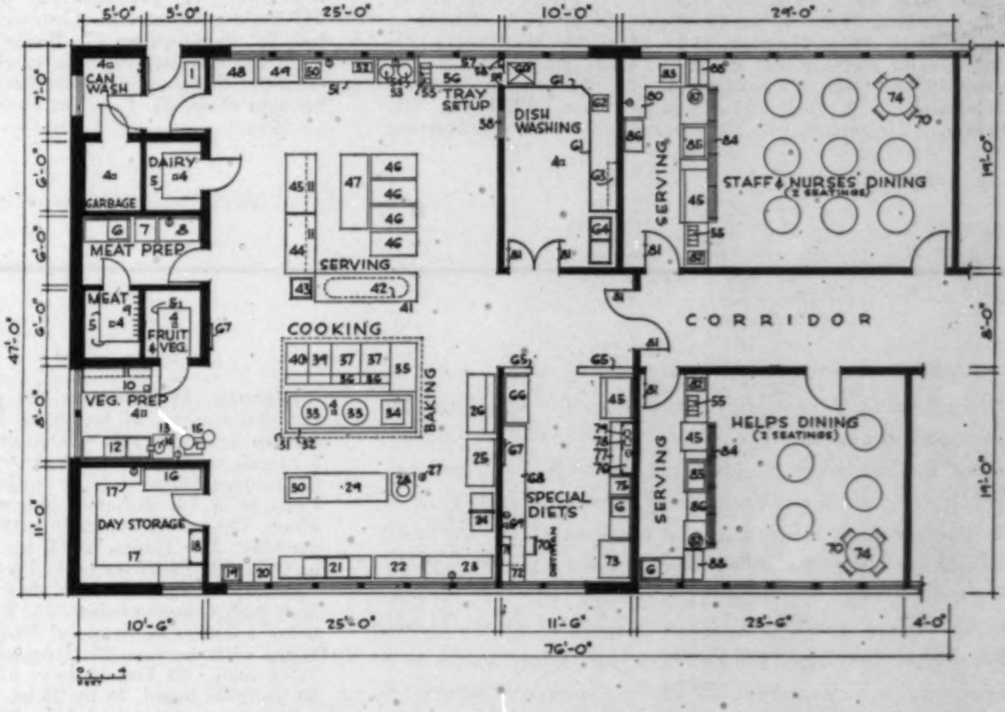
58. Service Group for Nursing Unit. **1.** Bed pan washer and sterilizer. **2.** Bulletin board, 26 by 24 in. **3.** Clinical sink with bed pan flushing attachment. **4.** Table, 16 by 20 in. **5.** Recessed cabinet. **6.** Waste paper receptacle. **7.** Counter, 36 in. high, with open shelving below. **8.** Sink in counter. **9.** Two shelves. **10.** Domelight and buzzer set, 5 ft. 6 in. from floor. **11.** Galvanized iron can. **12.** Shelf. **13.** Hook strip for grip sticks. **14.** Curb. **15.** Mop truck. **16.** Grab rail. **17.** Nurses' calling station (push button type). **18.** Drying rod set, 5 ft. 6 in. from floor. **19.** Towel bar. **20.** Straight chair. **21.** Hook strip. **22.** Corridor domelight. **23.** Ventilating grille. **24.** Obscure glass. **25.** Vision panel. **26.** Shelving.

59. Utility Room. **1.** Laundry hamper. **2.** Double compartment laundry tray with drainboards. **3.** Counter, 36 in. high, open below. **4.** Cracked ice bin (for external use only). **5.** Partition, 4 ft. 6 in. high. **6.** Single element hot plate on bracket. **7.** Sink in counter with gooseneck spout and knee or elbow control. **8.** Counter, 36 in. high, with cabinets below. **9.** Bulletin board, 26 by 24 in. **10.** Instrument sterilizer, 4 by 6 by 16 in. **11.** Wall cabinet. **12.** Domelight and buzzer set, 5 ft. 6 in. from floor. **13.** Vision panel. **14.** Dressing cart. **15.** Utensil sterilizer, 20 by 20 by 24 in. **16.** Clinical sink. **17.** Sanitary waste receptacle. **18.** Waste paper receptacle.

60. Floor Pantry (for Central Tray System). **1.** Counter, 36 in. high, open below. **2.** Juice extractor. **3.** Beverage mixer. **4.** Cracked ice bin. **5.** Counter, 36 in. high, with cabinets below. **6.** Electric toaster. **7.** Sink in counter. **8.** Wall cabinet. **9.** Refrigerator, 8 cu. ft. **10.** Dumbwaiter (32 by 20 in. cab) connected with kitchen. **11.** Vision panel. **12.** Domelight and buzzer set, 5 ft. 6 in. from floor. **13.** Telephone connection to kitchen. **14.** Bulletin board, 26 by 24 in. **15.** Towel bar. **16.** Sanitary waste receptacle. **17.** Double element hot plate.


71'-6"
5'-5"
16'-0"
29'-0"
11'-6"
7'-6"
24'-0"
GARBAGE
DAY STORAGE
POT WASHING
DIETITION
CAN WASHING
FRUIT & VEGETABLES
MEAT
DAIRY
BAKING
COOKING
SERVING
SPECIAL DIETS
DISH WASHING
PREPARATION AREA
VEGETABLES
MEATS
SALADS
TRAY SETUP
CORRIDOR

61. Kitchen for a 50-Bed General Hospital Using Central Tray Service


5'-0"
5'-0"
25'-0"
10'-0"
24'-0"
47'-0"
CAN WASH
DAIRY
GARBAGE
MEAT PREP
MEAT
FRUIT & VEG.
VEG. PREP
DAY STORAGE
SERVING
COOKING
BAKING
TRAY SETUP
DISH WASHING
SPECIAL DIETS
SERVING
STAFF & NURSES' DINING
(2 SEATINGS)
CORRIDOR
SERVING
HELPS DINING
(2 SEATINGS)
10'-6"
25'-0"
11'-6"
25'-6"
4'-0"
76'-0"

62. Kitchen for a 100-Bed General Hospital Using Central Tray Service

Legends: 61. Kitchen for a 50-Bed General Hospital Using Central Tray Service. **1.** Platform scale, 500 lb. capacity. **2.** Table, 24 by 24 in. **3.** Peeler, 15 lb. capacity, bench type. **4.** Double compartment sink and single drainboard. **5.** Work table, 24 by 96 in. with vegetable bins and refuse can space below. **6.** Meat block, 24 by 24 in. **7.** Table, 24 by 36 in. **8.** Food mixer, 20 qt. capacity, bench type. **9.** Baker's table, 30 by 60 in., with bins and drawers below, spice bins above. **10.** Sink and drainboard. **11.** Telephone outlet. **12.** Bulletin board, 26 by 24 in. **13.** Refrigerator with wood work top. **14.** Shelf over. **15.** Vision panel. **16.** Cook's table, 36 by 120 in. **17.** Pot rack. **18.** Bain Marie. **19.** Hood. **20.** Cereal cooker. **21.** Range with oven. **22.** Elevated broiler. **23.** Fryer. **24.** Roasting and baking oven (2 sections). **25.** Kettle, 20 gal. capacity. **26.** Floor drain. **27.** Steamer (2 compartments). **28.** Curb. **29.** Water cooler. **30.** Table, 24 by 60 in. **31.** Food cutter, 14 in. bowl. **32.** Refrigerator shelving. **33.** Hot water outlet. **34.** Steam outlet. **35.** Shelving, 18 in. wide, first shelf 36 in. above floor. **36.** Locked dish cabinet. **37.** Frozen food locker. **38.** Pot cabinet. **39.** Double compartment sink and drainboards. **40.** Meat slicer. **41.** Table, 24 by 60 in. with cabinet below. **42.** Bread box, 24 by 36 in. with cutting top. **43.** Urn stand, 24 by 42 in. **44.** Coffee urns, 5 gal. coffee, 10 gal. water. **45.** Ice cream cabinet. **46.** Tray table, 18 by 24 in. **47.** Partition, 3 ft. high. **48.** Filing cabinet below. **49.** Straight chair. **50.** Counter, 30 in. high, open below. **51.** Steam table. **52.** Domestic range. **53.** Wall cabinet. **54.** Counter, 36 in. high, with cabinets below. **55.** Juice extractor. **56.** Beverage mixer. **57.** Sink in counter. **58.** Refrigerator, 6 cu. ft. capacity. **59.** Tray trucks. **60.** Lavatory. **61.** Counter, 36 in. high, with open shelves below. **62.** Three shelves over. **63.** Meat hooks. **64.** Rack return slot. **65.** Open pass window. **66.** Dishwashing machine, 2500 pieces per hour. **67.** Vision window. **68.** Pre-rinse sink, 18 by 18 in. **69.** Soiled dish table. **70.** Shelf for soiled glasses. **71.** Double compartment sink, 24 by 24 by 14 in. each.

62. Kitchen for a 100-Bed General Hospital Using Central Tray Service. **1.** Platform scale, 500 lb. capacity. **2.** Hot water outlet. **3.** Steam outlet. **4.** Floor drain. **5.** Refrigerator shelving. **6.** Sink and drainboard. **7.** Meat block, 24 by 24 in. **8.** Table, 24 by 42 in. **9.** Meat hooks. **10.** Preparation table, 24 by 72 in., with vegetable bins and refuse can space below. **11.** Shelf over. **12.** Double compartment sink and single drainboard. **13.** Table, 24 by 24 in. **14.** Peeler, 15 lb. capacity, bench type. **15.** Food cutter, 15 in. bowl. **16.** Frozen food locker. **17.** Shelving, 18 in. wide, first shelf 36 in. above floor. **18.** Locked dish cabinet. **19.** Lavatory. **20.** Water cooler. **21.** Double compartment sink and drainboards. **22.** Pot cabinet. **23.** Table, 24 by 72 in. **24.** Pan rack. **25.** Refrigerator, 29 cu. ft. capacity. **26.** Baker's table, 30 by 60 in., with bins and drawers below, spice bins above. **27.** Floor outlet, (electric). **28.** Food mixer, 30 qt. capacity. **29.** Cook's table, 30 by 108 in. **30.** Sink in table. **31.** Hood. **32.** Curb. **33.** Kettles, 30 gal. capacity. **34.** Steamer, 3 compartments. **35.** Oven, 4 compartments. **36.** Salamander. **37.** Range with oven. **38.** Vision window. **39.** Spreader plate. **40.** Fryer. **41.** Cook's table, 30 by 108 in. **42.** Pot rack. **43.** Sink. **44.** Refrigerator with wood work top. **45.** Steam table with dish warming compartment below. **46.** Open tray trucks. **47.** Heated food truck. **48.** Ice cream cabinet. **49.** Bread box, 24 by 42 in. with wood cutting top. **50.** Meat slicer. **51.** Table, 24 by 72 in. **52.** Egg boiler. **53.** Urn stand. **54.** Coffee urns, 10 gal. coffee, 10 gal. water. **55.** Silver compartments. **56.** Counter, 36 in. high with open shelves below. **57.** Three shelves over. **58.** Rack return slot. **59.** Open pass window. **60.** Dishwasher, 3500 pieces per hour. **61.** Soiled dish table. **62.** Pre-rinse sink, 18 by 18 in. **63.** Shelf for soiled glasses. **64.** Double compartment sink, 24 by 24 by 14 in. ea. **65.** Partition, 36 in. high. **66.** Tray rack. **67.** Bulletin board, 26 by 24 in. **68.** Counter, 30 in. high. **69.** Telephone outlet. **70.** Straight chair. **71.** Shelf over. **72.** Filing cab-

(Continued on page 84)

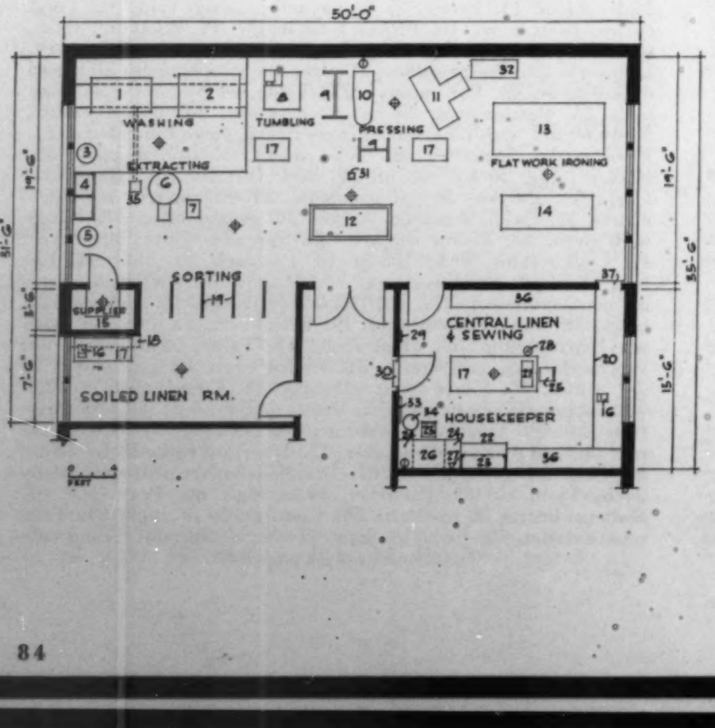
inet below. 73. Refrigerator, 12 cu. ft. capacity. 74. Dining room table. 75. Domestic range. 76. Wall cabinet. 77. Counter, 36 in. high, with cabinets below. 78. Juice extractor. 79. Beverage mixer. 80. Counter, 36 in. high, with open shelving below. 81. Vision panels. 82. Trays. 83. Sink in counter. 84. Tray slide. 85. Cold pan, glass shelf over. 86. Ice cream cabinet. 87. Coffee urn, 4 gal. 88. Water cooler.

63. Kitchen for a 200-Bed General Hospital Using Central Tray Service. 1. Platform scale, 500 lb. capacity. 2. Floor drain. 3. Hot water outlet. 4. Steam outlet. 5. Water cooler. 6. Lavatory. 7. Pot cabinet, 24 by 48 in. 8. Double compartment sink with drainboards. 9. Pan rack. 10. Refrigerator, 29 cu. ft. capacity. 11. Cook's table, 30 by 150 in. 12. Pot rack. 13. Sink in table. 14. Baker's table, 30 by 72 in., with bins and drawers below, spice bins above. 15. Shelving, 18 in. wide, first shelf 36 in. above floor. 16. Locked dish cabinet. 17. Frozen food locker. 18. Fish box, 24 by 36 in. 19. Table, 24 by 36 in. 20. Meat block, 24 by 24 in. 21. Sink, 24 by 24 in. 22. Meat hooks. 23. Refrigerator shelving. 24. Hood. 25. Curb. 26. Kettle, 80 gal. capacity. 27. Oven, 3 compartments. 28. Range with oven. 29. Salamander. 30. Shelf. 31. Spreader plate. 32. Fryer. 33. Steamer, 2 compartments. 34. Steam table with dishwarming compartment below. 35. Shelf over. 36. Open tray trucks. 37. Heated tray truck. 38. Overhead electric outlet. 39. Ice cream making and dispensing unit. 40. Table, 30 by 138 in. 41. Coffee urns. 42. Sink and drainboard. 43. Salad table, 30 by 72 in. 44. Cook's table, 30 by 144 in. 45. Filing cabinet below. 46. Floor outlet, (electric). 47. Food mixer, 60 qt. capacity. 48. Peeler, 30 lb. capacity. 49. Double compartment sink and single drainboard. 50. Table, 24 by 108 in. 51. Food cutter, 15 in. bowl. 52. Table, 24 by 84 in. 53. Meat slicer. 54. Egg boiler. 55. Toaster. 56. Bread box, 24 by 60 in. with wood cutting top. 57. Silver compartments. 58. Shelving over. 59. Counter, 36 in. high with open shelving below. 60. Rack return slot. 61. Open pass window. 62. Vision window. 63. Dishwasher, 6000 pieces per hour. 64. Soiled dish table. 65. Pre-rinse sink, 18 by 18 in. 66. Glass washer. 67. Clean glass table. 68. Double compartment sink, 24 by 24 by 14 in. 69. Vision panel. 70. Cabinet below counter. 71. Tray rack. 72. Wall cabinet. 73. Juice extractor. 74. Beverage mixer. 75. Counter, 36 in. high, with cabinets below. 76. Dumbwaiter. 77. Range with oven. 78. Counter, 36 in. high, open below. 79. Sink in counter. 80. Electric outlet for cart. 81. Filing cabinet. 82. Locker. 83. Telephone outlet. 84. Straight chair. 85. Counter, 30 in. high. 86. Bulletin board, 26 by 24 in.

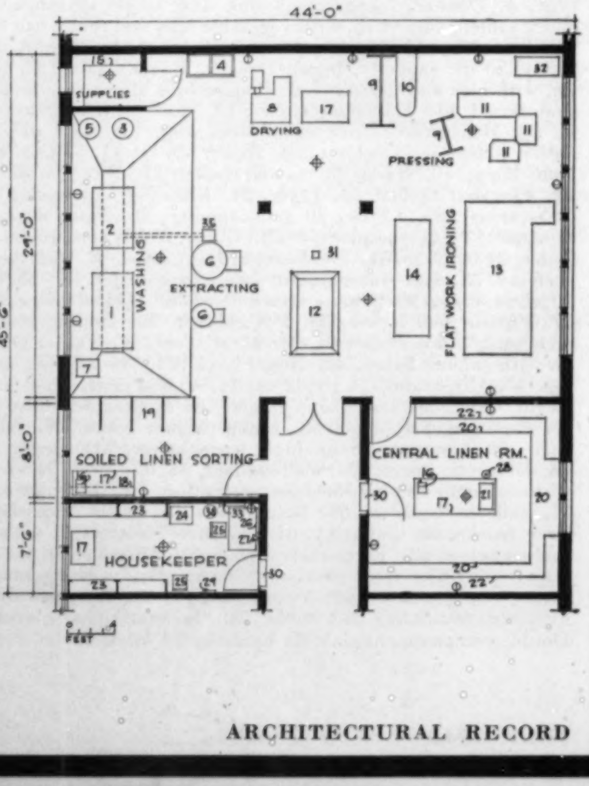
In small hospitals the laundry may be located in the basement with easy access to the elevators, but isolated from patient areas. Ceiling height should be not less than 12 ft., and mechanical ventilation will probably be required. In the layout of the laundry facilities, routing is of considerable importance; it will proceed from the soiled linen (sorting) room through (1) washing wheels, (2) extractors, starching, etc., (3) tumbler, flatwork ironer, presses, and hand finishing, to (4) the central linen room. The layout will probably require the services of a competent laundry engineer, for on the scheme will depend the efficiency of the laundry operation

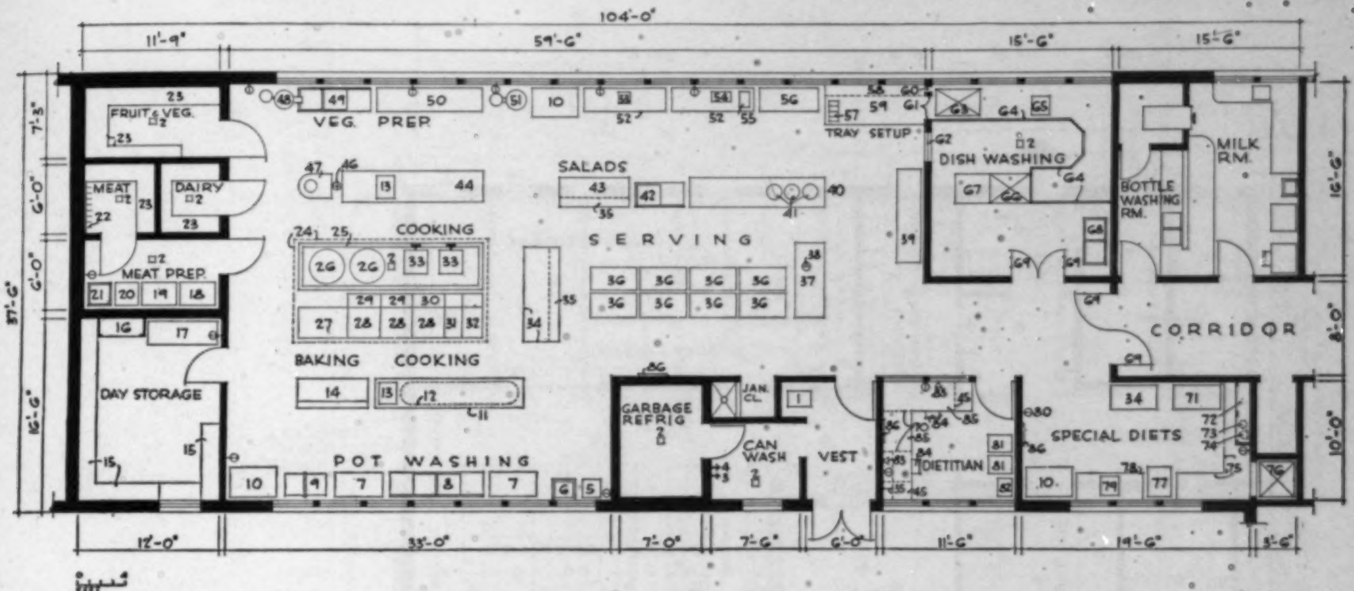
Legends: 64. Laundry for a 50-Bed General Hospital. 1. Metal washer, 24 by 36 in. 2. Metal washer, 36 by 36 in. 3. Soap tank, 30 gal. 4. Double compartment laundry trays. 5. Starch cooker, 15 gal. 6. Extractor, 26 in. 7. Platform scale. 8. Tumbler, 36 by 18 in. 9. Uniform rack. 10. Ironing board. 11. Press, 51 in. 12. Shakeout table with sloping sides. 13. Flat work ironer, 100 in. 14. Table, 36 by 96 in. 15. Shelving. 16. Marking machine. 17. Tables, 2–24 by 36 in., 1–24 by 60 in., 1–36 by 90 in. 18. Shelf over table. 19. Sorting bins. 20. Counter, 36 in. high with shelving below. 21. Sewing machine. 22. Counter, 30 in. high with cabinets below. 23. Wall cabinet. 24. Filing cabinets below counter. 25. Straight chair. 26. Counter 30 in. high, open below with drawers. 27. Telephone outlet. 28. Floor outlet. 29. Hook strip. 30. Dutch door. 31. Floor drain. 32. Compressor. 33. Bulletin board, 26 by 24 in. 34. Waste paper receptacle. 35. Sump. 36. Shelving with bins. 37. Pass window.

64. Laundry for a 50-Bed General Hospital



65. Laundry for a 100-Bed General Hospital




104'-0"
11'-9"
59'-6"
15'-6"
15'-6"
FRUIT & VEG.
VEG. PREP
MEAT
DAIRY
MEAT PREP.
DAY STORAGE
SALADS
COOKING
SERVING
BAKING
COOKING
POT WASHING
TRAY SETUP
DISH WASHING
MILK RM.
BOTTLE WASHING RM.
CORRIDOR
GARBAGE REFRIG
JAN. CL.
CAN WASH
VEST
DIETITIAN
SPECIAL DIETS
12'-0"
33'-0"
7'-0"
7'-6"
6'-0"
11'-6"
14'-6"
5'-6"
37'-6"
7'-3"
6'-0"
6'-0"
16'-6"
16'-6"
8'-0"
10'-0"

63. Kitchen for a 200-Bed General Hospital Using Central Tray Service

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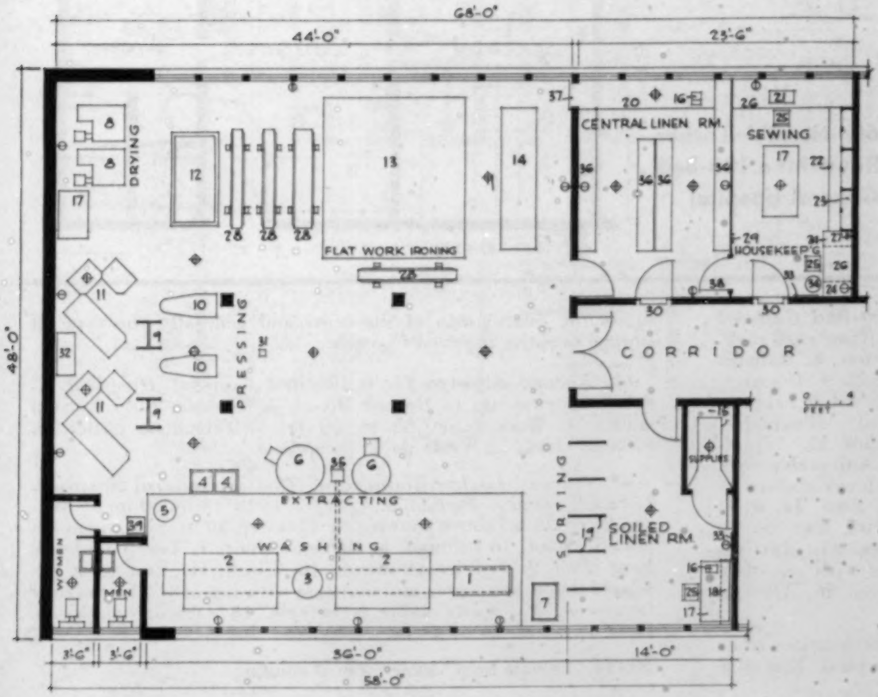
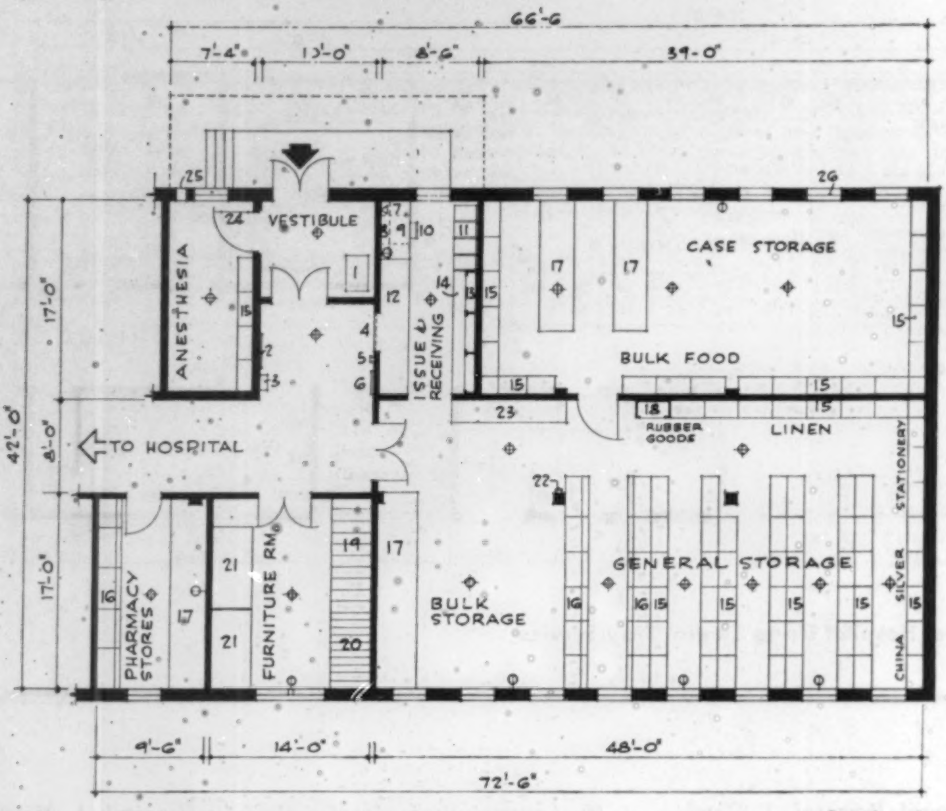
65. Laundry for a 100-Bed General Hospital. 1. Metal washer, 36 by 54 in. 2. Metal washer, 36 by 36 in. 3. Soap tank, 30 gal. 4. Double compartment laundry trays. 5. Starch cooker, 15 gal. 6. Extractor, 1–17 in. and 1–26 in. 7. Platform scale. 8. Tumbler, 36 by 30 in. 9. Uniform rack. 10. Ironing board. 11. Utility press. 12. Shakeout table with sloping sides. 13. Flat work ironer, 2 roll, 120 in. 14. Table, 36 by 120 in. 15. Shelving. 16. Marking machine. 17. Tables, 1–24 by 30 in., 1–24 by 64 in., 1–36 by 84 in., 1–32 by 48 in. 18. Shelf over table. 19. Sorting bins. 20. Counter, 36 in. high with shelving below. 21. Sewing machine. 22. Shelving with bins. 23. Wall cabinet. 24. Filing cabinet. 25. Straight chair. 26. Desk. 27. Telephone outlet. 28. Floor outlet. 29. Hook strip. 30. Dutch door. 31. Floor drain. 32. Compressor. 33. Bulletin board, 26 by 24 in. 34. Waste paper receptacle. 35. Sump.

66. Laundry for a 200-Bed General Hospital. 1. Metal washer, 24 by 36 in. 2. Metal washer, 42 by 54 in. 3. Soap tank, 90 gal. 4. Double compartment laundry trays. 5. Starch cooker, 25 gal. 6. Extractor, 1–17 in., 1–40 in. 7. Platform scale, flush with floor. 8. Tumbler, 36 by 30 in. 9. Uniform rack. 10. Ironing board. 11. Utility press. 12. Shakeout table with sloping sides. 13. Flat work ironer, 4 roll, 120 in. 14. Table, 36 by 144 in. 15. Shelving. 16. Marking machine. 17. Tables, 1–30 by 60 in., 1–30 by 48 in., 1–36 by 72 in. 18. Shelf over table. 19. Sorting bins. 20. Counter, 36 in. high with shelving below. 21. Sewing machine. 22. Counter, 30 in. high with cabinets below. 23. Wall cabinet. 24. Filing cabinets below counter. 25. Straight chair. 26. Counter, 30 in. high open below with drawer. 27. Telephone outlet. 28. Food rack. 29. Hook strip. 30. Dutch door. 31. Floor drain. 32. Compressor. 33. Bulletin board, 26 by 24 in. 34. Waste paper receptacle. 35. Sump. 36. Shelving with bins. 37. Pass window. 38. Gate. 39. Water cooler.


68'-0"
44'-0"
23'-6"
DRYING
FLAT WORK IRONING
CENTRAL LINEN RM.
SEWING
HOUSEKEEP'G
PRESSING
CORRIDOR
EXTRACTING
WASHING
SORTING
SOILED LINEN RM.
SUPPLIES
WOMEN
MEN
48'-0"
3'-6"
3'-6"
36'-0"
14'-0"
58'-0"

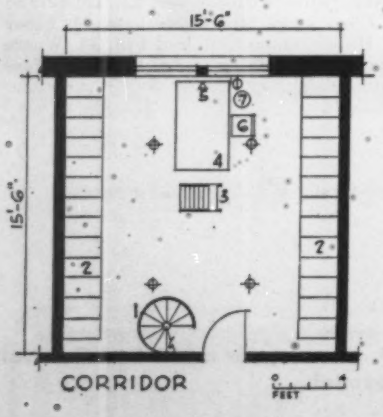
66. Laundry for a 200-Bed General Hospital

In the hospital laundry there is much sewing to be done, to repair gowns or linens, or just to salvage bandage material. In this larger laundry a separate sewing room is provided adjacent to the central linen room. The provision of toilet facilities within the area of the large laundry aids in efficiency and supervision

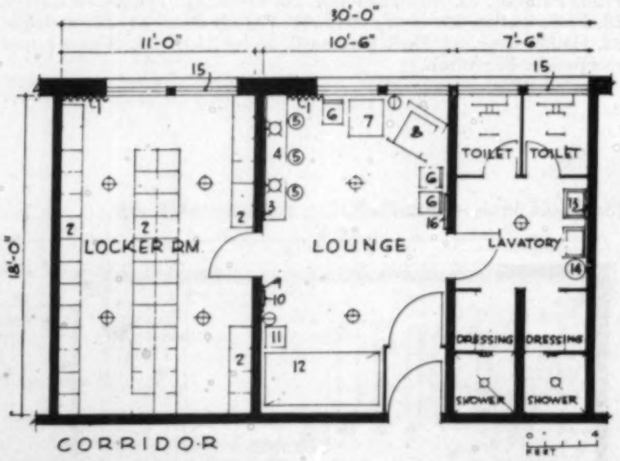

66'-6
7'-4"
10'-0"
8'-6"
39-0"
25
26
VESTIBULE
ANESTHESIA
24
ISSUE & RECEIVING
CASE STORAGE
BULK FOOD
17
17
18
RUBBER GOODS
LINEN
23
22
TO HOSPITAL
STATIONERY
GENERAL STORAGE
BULK STORAGE
PHARMACY STORES
FURNITURE RM.
21
21
19
20
SILVER
CHINA
17'-0"
8'-0"
42'-0"
17'-0"
9'-6"
14'-0"
48'-0"
72'-6"
FEET

67. Central Storeroom for a 100-Bed General Hospital

The central storeroom, which will accommodate a great variety of valuable stores, is planned to facilitate general supervision by one person, who besides checking in shipments will also check out supplies. He usually in addition checks the hospital help in and out of the service entrance. Anesthesia storage is a special problem, since it is explosive. Ventilation is especially necessary


15'-6"
15'-6"
CORRIDOR
FEET

68. Record Storage for a 100-Bed General Hospital


30'-0"
11'-0"
10'-6"
7'-6"
LOCKER RM.
LOUNGE
TOILET
TOILET
LAVATORY
DRESSING
DRESSING
SHOWER
SHOWER
CORRIDOR
FEET

69. Nurses' Locker Room for a 100-Bed General Hospital

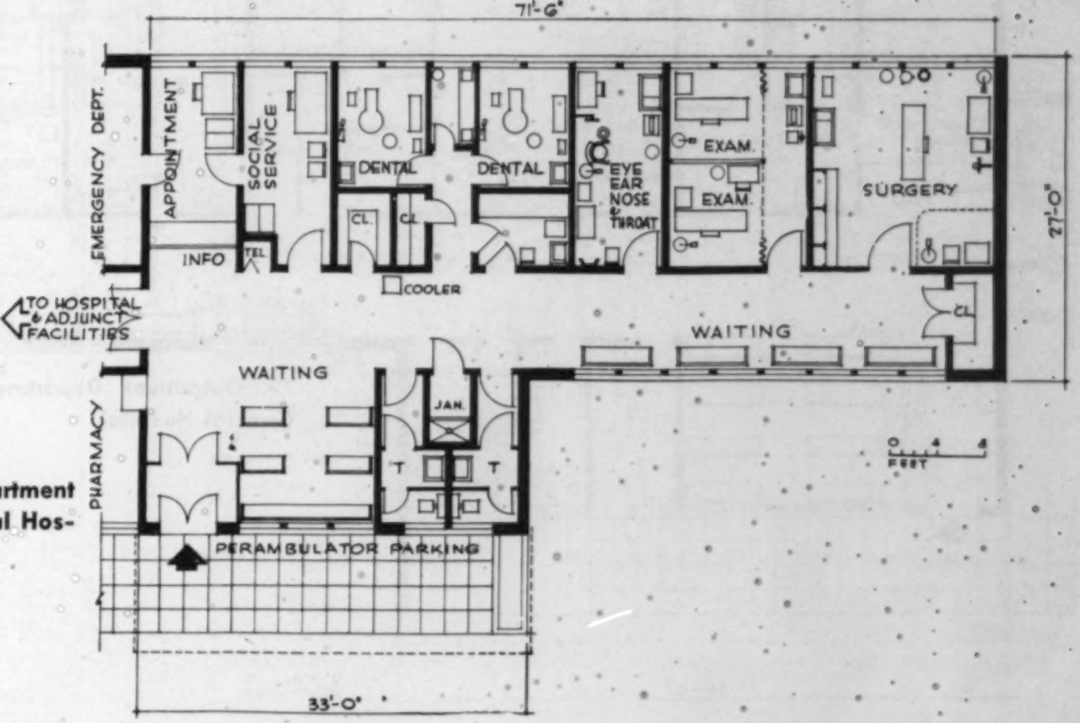
Legends: 67. Central Storeroom for a 100-Bed General Hospital. **1. Platform scale flush with floor. 2. Time card rack. 3. Time clock. 4. Rolling curtain. 5. Push button. 6. Bulletin board, 26 by 24 in. 7. Telephone outlet. 8. Shelf. 9. Counter, 30 in. high with drawers. 10. Straight chair. 11. Filing cabinet. 12. Counter, 42 in. high, open below. 13. Locked wall cabinets. 14. Counter, 36 in. high with locked cabinets below. 15. Adjustable steel shelving, open type, 18 in. deep. 16. Adjustable steel shelving with backs, upper shelves 18 in. deep, lower shelves 24 in. deep. 17. Wood platform raised 8 in. from floor. 18. Steel cabinet with shelving and doors. 19. Bed spring bins for 10 springs. 20. Bed head and foot bins for 10 sets. 21. Mattress rack for 5 mattresses. 22. Buzzer. 23. Counter with one shelf below. 24. Louvred door. 25. Vent at floor level. 26. All windows to be barred.**

NOTE: The size of the Central Storeroom and proportions of its various units will vary with each individual hospital. This plan shows the relationship of the units and generally the type of storage facilities required for each.

68. Record Storage for a 100-Bed General Hospital. **1. Spiral stairway up to Record Room. 2. Transfer files. 3. Step ladder. 4. Work table, 36 by 60 in. 5. Telephone outlet. 6. Straight chair. 7. Waste paper receptacle.**

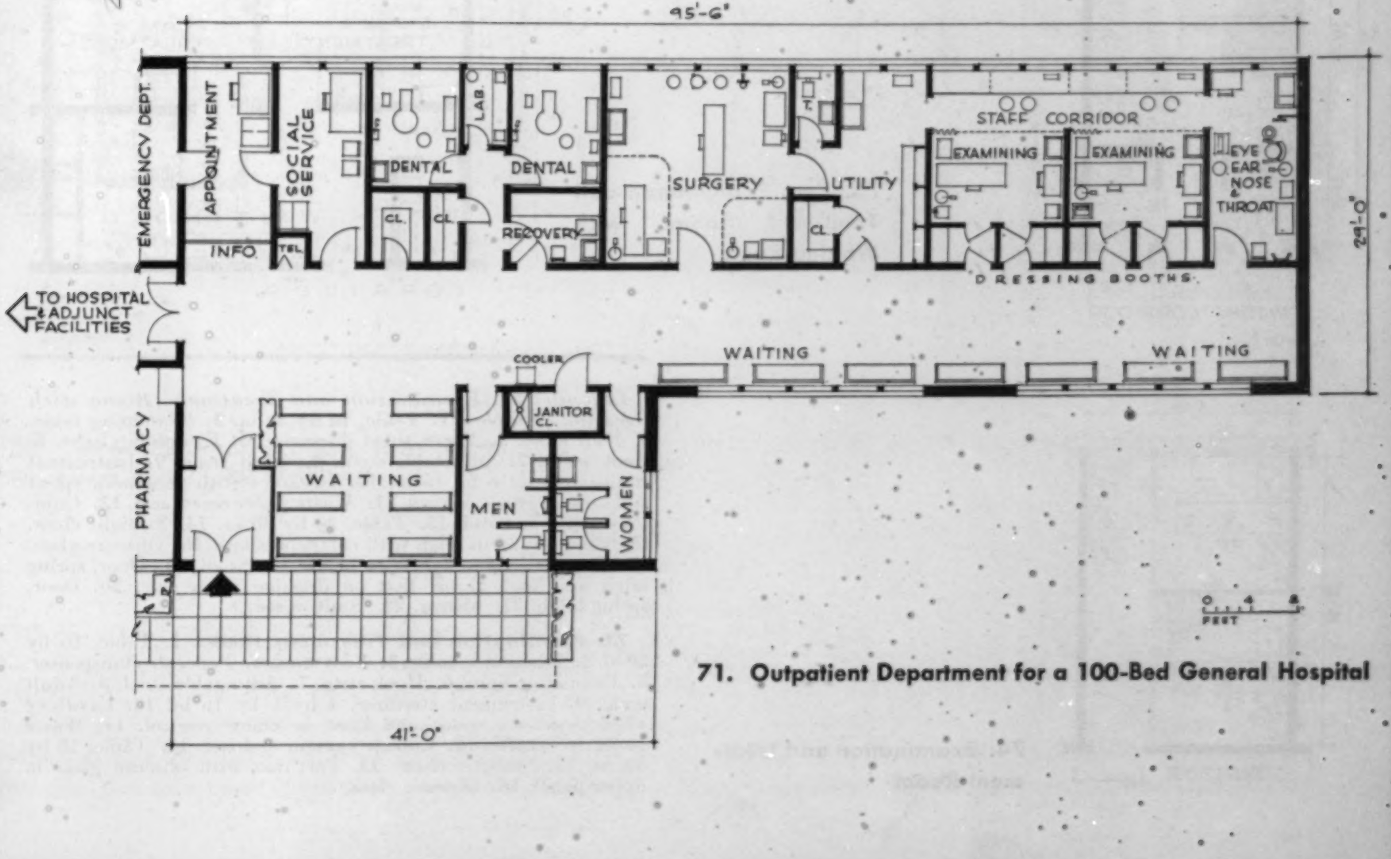
69. Nurses' Locker Room for a 100-Bed General Hospital. **1. Sliding window curtain. 2. Lockers, 15 by 15 by 60 in. 3. Mirror, 84 by 24 in. above counter. 4. Counter, 30 in. high, open below. 5. Stool, 18 in. high. 6. Straight chair. 7. Lamp table. 8. Easy chair. 9. Full length mirror. 10. Clock. 11. End table. 12. Combination box spring and mattress with legs. 13. Mirrors over lavatories. 14. Waste paper receptacle. 15. Obscure glass. 16. Bulletin board, 26 by 24 in.**

NOTE: Female help locker room is similar.

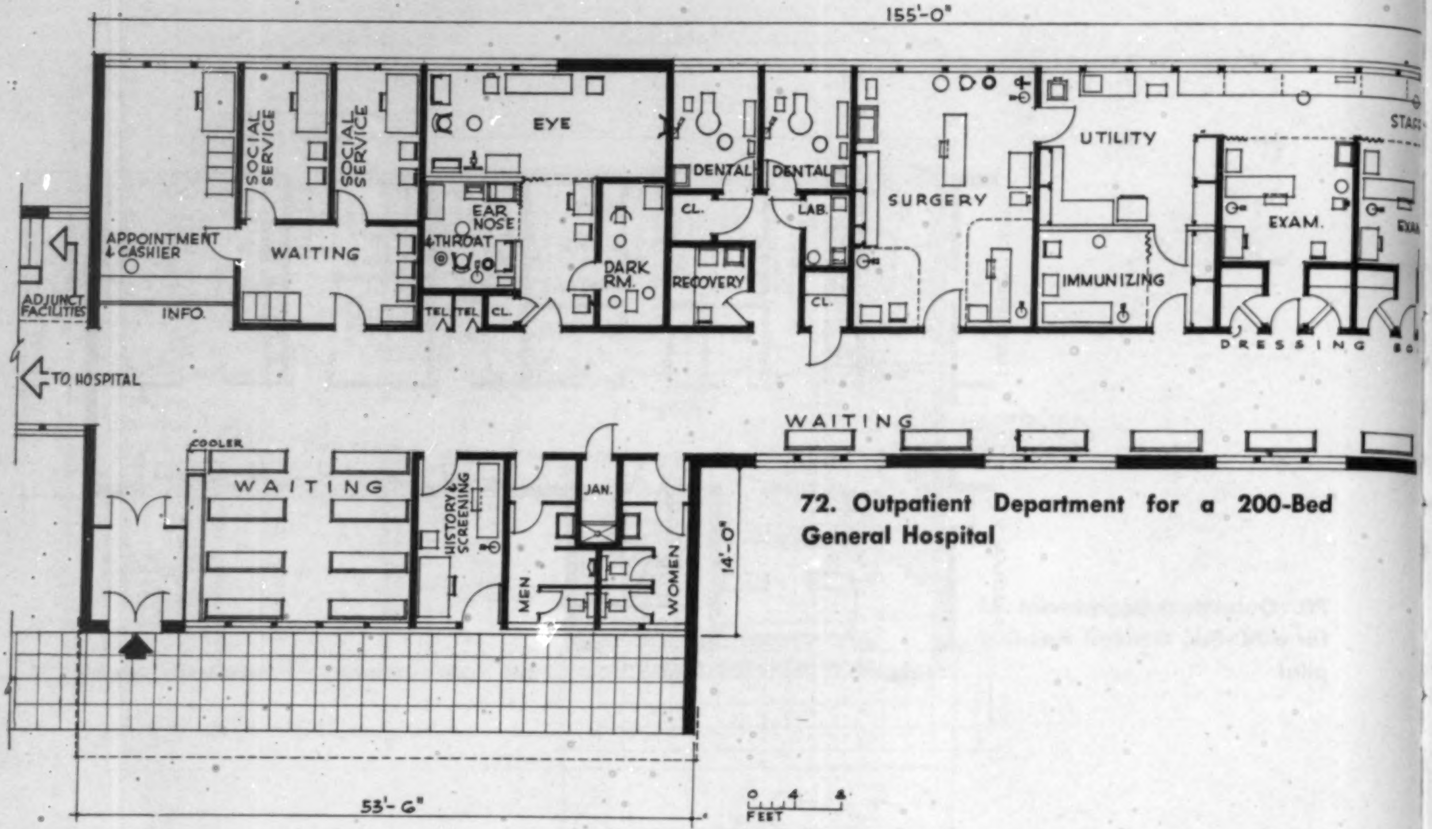

71'-6"
EMERGENCY DEPT.
APPOINTMENT
SOCIAL SERVICE
DENTAL
DENTAL
CL.
CL.
EYE EAR NOSE & THROAT
EXAM.
EXAM.
SURGERY
27'-0"
INFO
TEL
COOLER
TO HOSPITAL & ADJUNCT FACILITIES
WAITING
CL
WAITING
JAN.
T
T
PHARMACY
PERAMBULATOR PARKING
0 4 8 FEET
33'-0"

70. Outpatient Department for a 50-Bed General Hospital

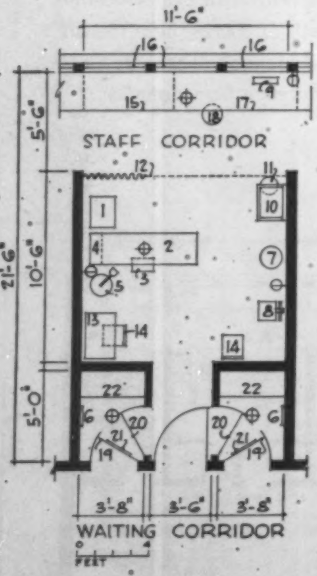
Really the outpatient department has little relation to the size of the hospital; its size and facilities depend more on the amount of the "charity load." It would be located, of course, near the administration department and near the adjunct diagnostic and treatment facilities. The "staff corridor" is a good feature; it permits circulation of doctors without interference from patients


95'-6"
EMERGENCY DEPT.
APPOINTMENT
SOCIAL SERVICE
DENTAL
LAB.
DENTAL
CL.
CL.
RECOVERY
SURGERY
UTILITY
CL
STAFF CORRIDOR
EXAMINING
EXAMINING
EYE EAR NOSE & THROAT
29'-0"
DRESSING BOOTHS
INFO.
TEL
TO HOSPITAL & ADJUNCT FACILITIES
WAITING
WAITING
COOLER
JANITOR CL.
PHARMACY
WAITING
MEN
WOMEN
0 4 8 FEET
41'-0"

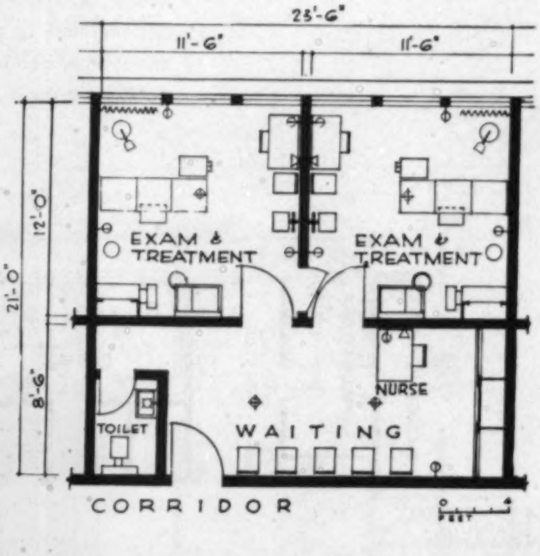
71. Outpatient Department for a 100-Bed General Hospital


155'-0"
SOCIAL SERVICE
SOCIAL SERVICE
EYE
DENTAL
DENTAL
SURGERY
UTILITY
EXAM.
APPOINTMENT & CASHIER
WAITING
EAR NOSE & THROAT
DARK RM.
CL.
LAB.
RECOVERY
IMMUNIZING
ADJUNCT FACILITIES
INFO.
TEL
TEL
CL.
CL.
DRESSING
TO HOSPITAL
WAITING
COOLER
WAITING
HISTORY & SCREENING
JAN.
MEN
WOMEN
14'-0"
53'-6"
0 4 8
FEET

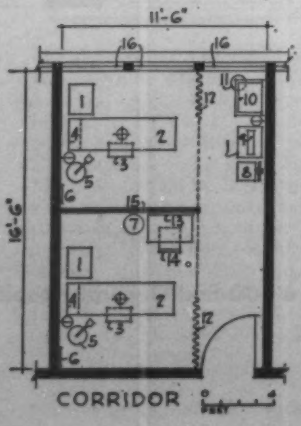
72. Outpatient Department for a 200-Bed General Hospital


11'-6"
16
16
15
17
9
18
STAFF CORRIDOR
12
11
10
1
2
3
4
5
7
8
13
14
14
22
22
6
20
21
19
20
21
6
19
21'-6"
5'-6"
10'-6"
5'-0"
3'-8"
3'-6"
3'-8"
WAITING
CORRIDOR
FEET

73. Examination and Treatment Room with Dressing Cubicles


23'-6"
11'-6"
11'-6"
EXAM & TREATMENT
EXAM & TREATMENT
NURSE
TOILET
WAITING
CORRIDOR
21'-0"
12'-0"
8'-6"
FEET

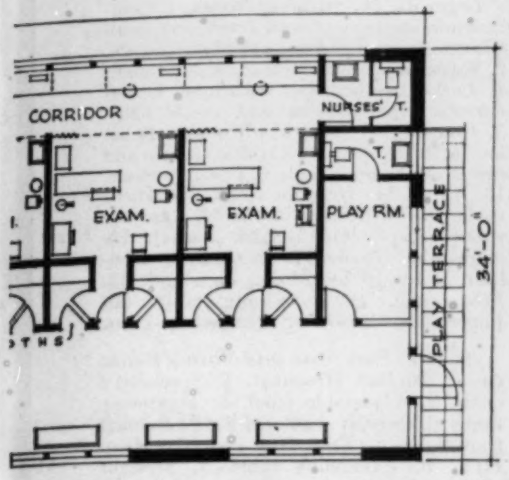
75. Two Examination and Treatment Rooms with Waiting Room


11'-6"
16
16
11
10
12
1
2
3
4
5
6
9
8
15
7
13
14
1
2
3
4
5
6
12
16'-6"
CORRIDOR
FEET

74. Examination and Treatment Room

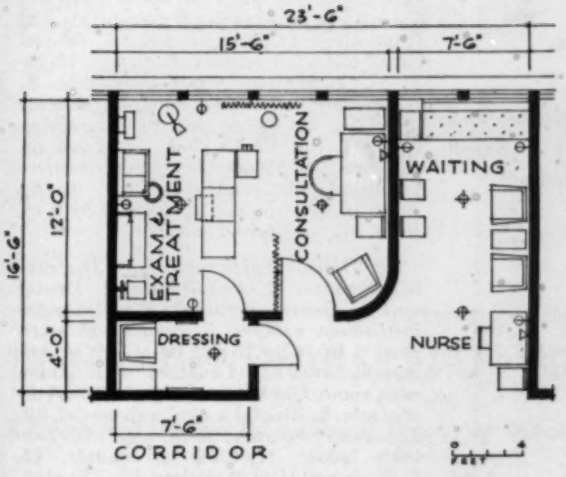
Legends: 73. Examination and Treatment Room with Dressing Cubicles. 1. Table, 16 by 20 in. 2. Examining table. 3. Foot stool. 4. Paper sheet dispenser. 5. Examining light. 6. Hook strip. 7. Adjustable stool. 8. Adult scale. 9. Instrument sterilizer, 4 by 6 by 16 in. 10. Lavatory with gooseneck spout and knee or elbow control. 11. Waste paper receptacle. 12. Cubicle curtain and rod. 13. Table, 20 by 30 in. 14. Straight chair. 15. Counter, 36 in. high with cabinets below. 16. Obscure glass. 17. Counter, 36 in. high, open below. 18. Stool. 19. Door, spring latch and with throw bolt on dressing room side. 20. Door, spring latch. 21. Mirror. 22. Built-in seat.

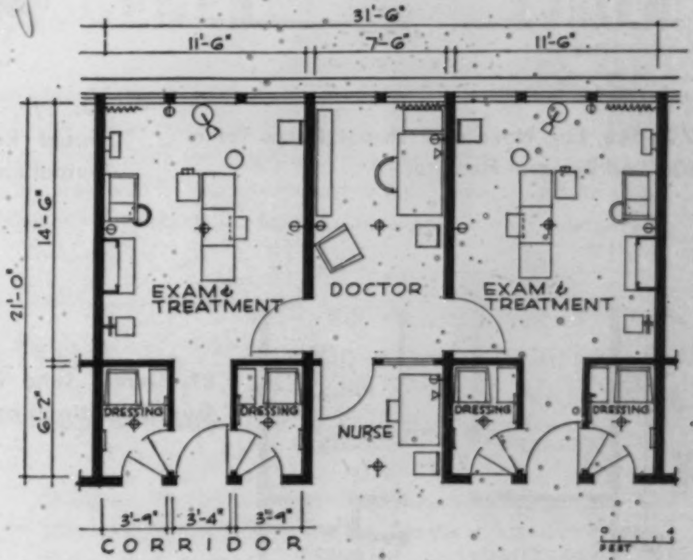
74. Examination and Treatment Room. 1. Table, 16 by 20 in. 2. Examining table. 3. Foot stool. 4. Paper sheet dispenser. 5. Examining light. 6. Hook strip. 7. Adjustable stool. 8. Adult scale. 9. Instrument sterilizer, 4 by 6 by 16 in. 10. Lavatory with gooseneck spout and knee or elbow control. 11. Waste paper receptacle. 12. Cubicle curtain and rod. 13. Table, 18 by 30 in. 14. Straight chair. 15. Partition with obscure glass in upper panel. 16. Obscure glass.


CORRIDOR
NURSES' T.
T.
EXAM.
EXAM.
PLAY RM.
PLAY TERRACE
34'-0"

CLINICAL DIVISIONS				ASSIGNMENT OF STATIONS											
Clinic	Treatments Per Week	Treatments Per Year	Station Sessions Per Week	Mon.		Tues.		Wed.		Thurs.		Fri.		Sat.	
				am	pm	am	pm	am	pm	am	pm	am	pm	am	pm
General Surgery	78	4,056	6		1	1		1			1	1			1
Proctology	3	156	1		1										
Urology	11	572													
Dental	56	2,912	6		2						2			2	
Gynecology	23	1,196	2	1				1							
Obstetric	20	1,040	2	1							1				
Orthopedic	28	1,456	2			1									1
Eye	31	1,612	2	1						1					
Ear, Nose & Throat	37	1,924	3			1				1					1
General Medicine	102	5,304	11	1		2		2		2		2		2	
Neuro Psychology	9	468	1							1					
Pediatric	43	2,236	5		1						1	1		1	1
Dermatology & Syphilology	29	1,508	3				1		1				1		
Physical Therapy	12	624	2	1											1
Totals	482	25,064	46	5	5	5	1	4	1	5	5	4	1	5	5

The outpatient load usually depends not on the size of the hospital but on the situation and policy of the hospital with regard to clinical work, largely for charity patients, or possibly for research. An analysis of the expected load is a planning requirement. The table above is a sample of such a study, with assignment of stations for each type of outpatient work

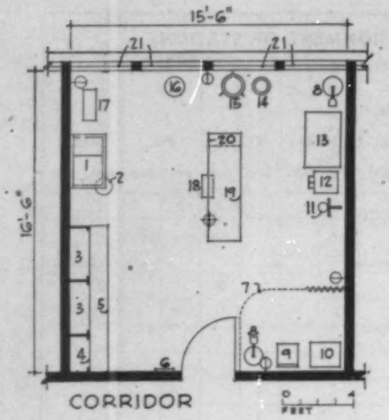

23'-6"
15'-6"
7'-6"
16'-6"
12'-0"
4'-0"
EXAM & TREATMENT
CONSULTATION
WAITING
DRESSING
NURSE
7'-6"
CORRIDOR
FEET


31'-6"
11'-6"
7'-6"
11'-6"
21'-0"
14'-6"
6'-2"
EXAM & TREATMENT
DOCTOR
EXAM & TREATMENT
DRESSING
DRESSING
NURSE
DRESSING
DRESSING
3'-4"
3'-4"
3'-4"
CORRIDOR
FEET

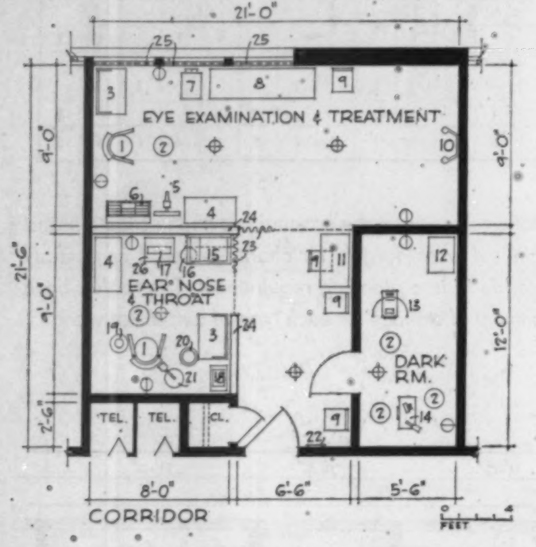
76. Combined Doctor's Office, Examination and Treatment Room with Waiting Room

77. Doctor's Office with Two Examination and Treatment Rooms

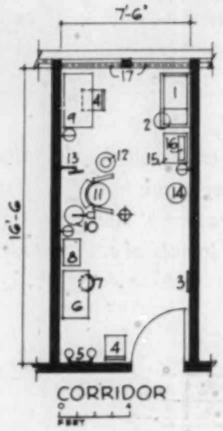
Plan 73, a typical treatment and examination room for the outpatient department, has two noteworthy points: the staff corridor running along the rear of the rooms permits the doctors to get from one room to another quickly without having to mix with the patients in the main corridor; and the dressing cubicles with the two doors give some privacy to patients, while serving to speed the use of the room. Plan 74 shows a minimum room for treatment and examination in a conventional scheme; its provision for circulation is a good feature. Plan 76 illustrates something new in the general hospital — an office for private practice by a physician in the hospital. Again, the dressing room saves time. The next plan shows a larger version of the same scheme



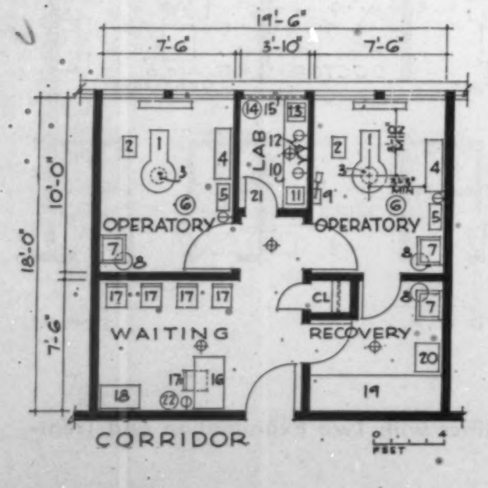
78. Surgical Room



79. Eye, Ear, Nose and Throat Room for a 200-Bed General Hospital



80. Eye, Ear, Nose and Throat Room for a Small Outpatient Department



81. Dental Suite with Two Operating Rooms

Legends: 78. Surgical Room. **1.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **2.** Waste paper receptacle. **3.** Wall cabinet. **4.** Locked wall cabinet with inner locked narcotic compartment and inside light. **5.** Counter, 36 in. high, with cabinets below. **6.** Hook strip. **7.** Cubicle curtain and rod. **8.** Examining light. **9.** Straight chair. **10.** Table. **11.** Irrigator stand. **12.** Mayo table. **13.** Instrument table. **14.** Sanitary waste receptacle. **15.** Kick bucket. **16.** Adjustable stool. **17.** Instrument sterilizer, 9 by 10 by 20 in., on stand. **18.** Foot stool. **19.** Examining table. **20.** Paper sheet dispenser. **21.** Obscure glass.

79. Eye, Ear, Nose and Throat Room for a 200-Bed Hospital. **1.** Specialist's chair. **2.** Adjustable stool. **3.** Treatment table. **4.** Supply cabinet. **5.** Examining spot light. **6.** Trial lens case. **7.** Mayo table. **8.** Examining table. **9.** Straight chair. **10.** Illuminated test card cabinet. **11.** Table, 20 by 36 in. **12.** Table for transillumination equipment. **13.** Perimeter. **14.** Slit lamp. **15.** Combination instrument and scrub sink with gooseneck spout and knee control. **16.** Waste paper receptacle. **17.** Instrument sterilizer, 4 by 6 by 16 in. **18.** Compressed air and vacuum apparatus. **19.** Fountain cuspidor. **20.** Sanitary waste receptacle. **21.** Examining light. **22.** Hook strip. **23.** Sliding curtain. **24.** Partition, 6 ft. high. **25.** Shades or venetian blinds. **26.** Table, 16 by 20 in.

80. Eye, Ear, Nose and Throat Room for a Small Outpatient Department. **1.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **2.** Waste paper receptacle. **3.** Hook strip. **4.** Straight chair. **5.** Illuminated test card cabinet. **6.** Table, 18 by 33 in. **7.** Sanitary waste receptacle. **8.** Compressed air and vacuum apparatus. **9.** Table, 20 by 36 in. **10.** Examining light. **11.** Specialist's chair. **12.** Fountain cuspidor. **13.** Adjustable eye range mirror. **14.** Adjustable stool. **15.** Table, 16 by 20 in. **16.** Instrument sterilizer, 4 by 6 by 16 in. **17.** Lightproof shades.

81. Dental Suite with Two Operating Rooms. **1.** Dental chair. **2.** Dental unit. **3.** Dental operating light. **4.** Dental instrument cabinet. **5.** Instrument sterilizer, 4 by 6 by 16 in., on stand. **6.** Adjustable stool. **7.** Lavatory with gooseneck spout and knee control. **8.** Towel receptacle. **9.** Dental x-ray, wall model. **10.** Laboratory counter, 36 in. high with cabinets below. **11.** Sink in counter. **12.** Gas, air and electric outlets. **13.** Developing tank. **14.** Compressor. **15.** Lightproof shade. **16.** Desk, 20 by 36 in. **17.** Straight chair. **18.** Filing cabinet. **19.** Built-in couch. **20.** Bedside table, 16 by 20 in. **21.** Lightproof door with louvre. **22.** Waste paper receptacle.

Final determination of facilities to be included in the outpatient department depends to a large extent on the peculiar situation of the hospital. These last plans in the series show what might be considered normal facilities in the fairly large outpatient department — a room for minor surgery; eye, ear, nose and throat rooms; and a dental suite — there are others that might logically be included in certain hospitals. Naturally this selection assumes convenient access to the other facilities in the hospital, but there is a limit to the load that the main hospital can take from the outpatient department, and the latter should be reasonably well equipped for its normal purposes. The eye, ear, nose and throat rooms, it will be noted, show a considerable difference. The smaller one could be made to function, in a small outpatient department, but the larger one is none too big for a 200-bed hospital; it might even be considered a minimum for modern medical practice

Photo Courtesy Emerson E. Neuthardt

Architectural Record's

Building Types Study Number 115

Prepared in collaboration with

School Shop

THE SCHOOL SHOP FOR GENERAL EDUCATION

Only one boy or girl out of every six attending high school or junior high will go directly into industry after graduation; but every boy and girl without exception will live in a society that is more and more industrial.

This fact makes it supremely important that our growing citizens have some first-hand acquaintance with industrial aims, industrial tools, industrial materials. Special attention must therefore be given by school planners to those "industrial arts" work centers which have come up only recently from the basement where they previously subsisted as "manual training" rooms carved out of the coal bin as an afterthought.

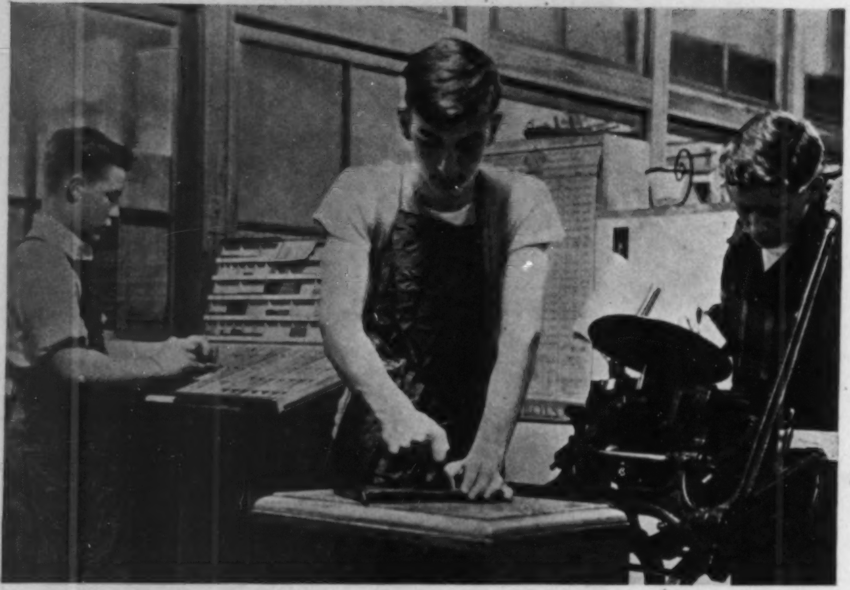
TYPES OF INDUSTRIAL EDUCATION

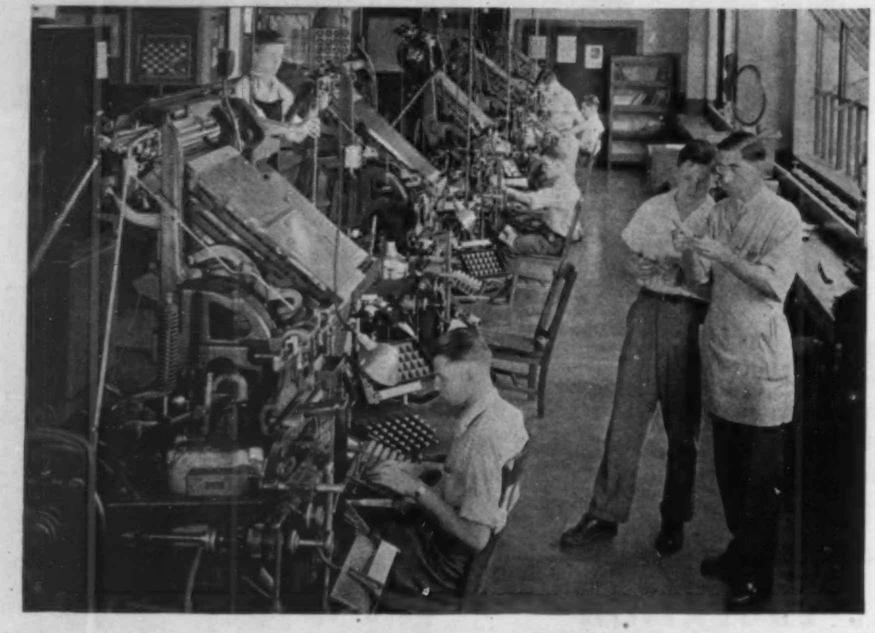
By Arthur B. Mays, Professor of Industrial Education, University of Illinois

ORGANIZED education involves two major aspects, (1) cultural and (2) vocational. It is true that all cultural education has some vocational significance and all vocational education contributes something to culture. However in the one phase of education the predominant purpose is the development of culture, the pushing back of horizons, increasing understanding, and socially desirable appreciations and relationships; whereas in the other, the major purpose is training and education for occupational competency both for individual and social welfare and progress. The term "vocational education" is a broad one including all forms of education and training which are designed to prepare persons for successful occupational work.

"Industrial education" has come to mean, in the United States, those types of education and training which deal with the technical knowledge and skills involved in the industries and mechanical trades. In this broad sense it includes certain divisions of engineering as well as trade education, and the nonvocational school subject called industrial arts. However, common usage during recent years has made the term "industrial education" mean only the two divisions of organized instruction known as, (1) industrial arts, or the *nonvocational* type of industrial education, and (2) *vocational* industrial education, which includes trade training and training for the other industrial occupations of less than college grade.

Of the two divisions of industrial education, what is now called industrial arts (formerly known as "manual training") has been in the schools of this country since 1880, and it is the more widespread form of industrial education found in the public schools. It is nonvocational. It has two major divisions, namely, elementary





Two photographs which strikingly illustrate the difference between "industrial arts" education and vocational education. The upper one, which was taken in the Bethlehem Central School, Delmar New York (plans on page 104) shows every essential printing operation in a single view — composition, imposition, presswork. These boys will be familiar with the basic processes in printing. The lower view shows boys who are under training to become linotype operators, learning that thoroughly

and secondary. Elementary industrial arts includes many forms of handwork such as basketry, modeling, block printing, thin woodwork, weaving, and other such activities suitable for children in the grades below the high school, and which have played a part in the history of civilization and are such as will promote the intellectual, aesthetic, and manual development of children. This work also serves to sharpen interest in the world in which the children live and grow, and to help them understand it. Much progress has been made in recent years in this division of industrial arts, and its educative values are no longer questioned by educators. In fact, elementary industrial arts is now generally regarded as an essential feature of modern general education, and as an important basic preparation for the secondary-school types of industrial arts. It has other special values that are recognized as contributing to the intellectual and aesthetic development of children that cannot be achieved in any other way. This division of industrial arts is often closely related to the art instruction of the elementary schools and, as far as possible, to all the other phases of instruction. Its correlation with all the school activities is particularly important if maximum educative values are to result.

The underlying purpose of industrial arts at the secondary-school level is to enable boys and girls, who now live in an industrial world and soon will have to cope with it as adults, to become intelligent concerning their industrial environment, and be able to deal with it effectively, both now and later. The materials, products, and processes of industry constitute one of the most obtrusive and ubiquitous factors in the modern environment. This may easily be tested by the reader. If he will look about him for a moment he will observe that everything in the room where he is sitting, while he reads, except his own body and personality, is the product of industry. His clothes, his chair, the floor, the walls, the house itself, and every material object in the room resulted from the work of industry, and to a striking degree his own personality is greatly modified by modern industry. This being true, it is imperative that every boy and girl shall become intelligent about, and effective in dealing with, modern industry and its many products. To produce such intelligence and effectiveness is the primary function of industrial arts in the junior and senior high schools.

There are, of course, specific training objectives involved in the purposes of industrial arts. Some of the more important of these are: the development of efficient work habits, the development of the habit of clear analytical thinking when dealing with mechanical and constructive work; the development of skill in cooperating with others in constructive enterprises; the acquisition of a wide range of knowledge and appreciation concerning industrial materials, processes and products; the development of a wide range of tool, machine, and drafting skills; the development of safety habits when in the presence of tools, machines, and other mechanical equipment; the development of the ability to use effectively one's knowledge of mathematics and other useful knowledge in meeting the practical work-problems of life; and various other similar objectives. There are numerous industries from which the subject matter of industrial arts is drawn. In general they are the basic and highly important industries which underlie modern industrial civilization. The significance of certain industries as factors in the creation of modern civilization can be indicated by the simple device of asking the question: "If this industry had never existed would civilization today be quite different in character?" By applying this test it will be found that there are twelve or thirteen industries that may properly be designated as "basic". They include such industries as the wood industries, metal industries, ceramic industries, the graphic-arts industry, the transportation industry, the power industry, etc.

Two types of shops are commonly used to achieve the ends of this phase of school work, namely (1) the general shop, in which several industries or divisions of a single industry are represented, and (2) the unit shop, in which a single industrial occupation is represented. There are several types of general shops in use. The two most common types are: (1) the shop where four or more different "areas" of industry are represented, such as, wood, metal, the graphic arts, plastics, power, communications, ceramics, etc., and (2) the shop which represents several phases of a single major division of industry, as, a *general* wood shop, a *general* metal shop, or a *general* graphic-arts shop, etc. The former of these is sometimes called "a laboratory of industry" particularly where much emphasis is placed upon industrial information and certain elementary activities of an experimental nature. In all types of industrial-arts shops attention is given to the use of films, models, assigned readings, class reports, etc., for the purpose of extending the understanding of pupils with reference to modern industry. The *general shop* has had its most important growth at the junior-high-school level and it seems to be the most effective means of realizing the aims of industrial arts at that level.

In the senior high school, and often in the ninth grade, the prevailing practice is to use the *unit shop* to reach the objectives of industrial arts. It is at this level that many persons become confused with reference to the difference between nonvocational and vocational-industrial education. The confusion results chiefly from the fact that the equipment, methods of instruction, and the character of work done differ little, if any, from the vocational shop. Indeed, in some schools the wood shop, the machine shop, or the drafting room may be used part of the day for industrial-arts classes and part of the day, and in the evening, for vocational classes. The difference lies not in the character of the equipment or even in the quality of work performed, but in the purposes of the pupils and the aims of the instruction. In this age all men and most women need at least some experience during their school life of the kind provided by industrial-arts shops and drafting rooms, regardless of the occupations followed in subsequent adult life. Many students in industrial classes plan to continue their education in college immediately after high-school graduation, while others plan to begin business or home-making careers. Obviously, to them their high-school industrial-arts courses do not mean vocational education. It is true, however, that a considerable number of boys expect to enter the trades or to work at semi-skilled occupations in factories soon after graduation. For these, their early industrial-arts experiences have definite vocational values. Even those who plan to enter trade courses in the last years of high school, or during the immediate post-high-school years, find their industrial-arts courses excellent foundation training. These considerations, however, in no wise change the basic purposes of industrial arts and should not lead to confusion in terminology. Many so-called "academic" subjects also are basic to numerous types of vocational education and to the practice of many vocations, but one rarely hears them referred to as "vocational subjects." It is important for the progress of both industrial arts and vocational-industrial education that the layman, as well as the professional educator, distinguish clearly between the purposes of each kind, or department, of industrial education.

The content of vocational-industrial education is derived from the results of an industrial survey of the community which reveals what trades or other industrial occupations are in need of trained workers. The content of industrial arts, on the other hand, is drawn from the basic and significant new industries, and the skills and facts taught are those which give an adequate representation of industry, and are such as have *general* educative value.

Safety is always important in the school shop, requiring the attention of department heads and teachers. Where lively boys and girls are concerned, safety administration demands all possible skill and ingenuity. Injuries to school pupils may maim them for life. Safety is therefore one of the first considerations in planning the shop size, shape, and equipment arrangement. Safety instruction is also one of the prime factors.

PLANNING THE INDUSTRIAL-ARTS SHOP

THE "industrial arts" shop is the opposite of a vocational shop. The vocational shop trains for specific jobs in industry. The industrial arts shop educates all citizens for life in an industrial environment.

Both kinds use many processes and tools in common. This creates obfuscation in many minds. For practical results the architect must have a clear grasp of the basic distinctions, while he steers clear of family quarrels by providing the kind of industrial arts shop that can be converted easily to suit the views of successive teachers.

The accompanying diagram (figure 1) seems to represent distinctions that are basic.

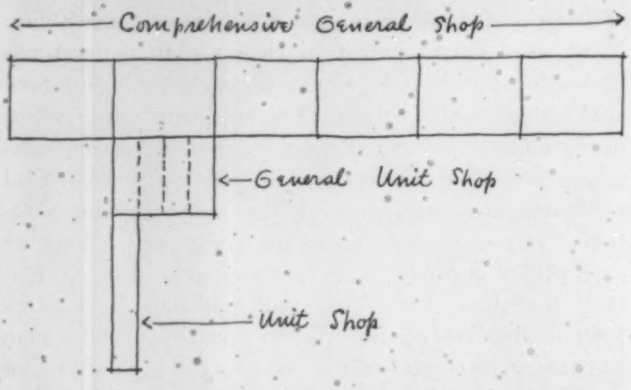


Figure 1. Various kinds of industrial arts shops (see text).-Adapted from Roy G. Fales, New York State Education Department

The comprehensive general shop (top row of rectangles) is the school shop for general education about industry, giving a diversified experience with industrial methods, in compact space. Each square represents a component unit; each unit is one general field of industrial operation, such as electrical work, or metal work, or wood work, or machining, ceramics, textiles, printing, food processing, graphic arts, photography.

The general unit shop is represented by one of these squares separated from the rest. It still stands for one general field of industrial endeavor, and not training for a single job. It is shown alone because it is either one of a series in a large school, or it is the only kind of industrial education for which the school in question has the vision or personnel.

The unit industrial shop, omitting the adjective "general," is indicated as a thin sliver, because it represents a single activity within a general field. It may be just a welding shop, not a general metal shop; or it may teach automobile repairing alone, not general machine work. This sub-unit tends always to slip in the direction of the vocational type of training — indeed, a good vocational course would be conducted in just such units, somewhat more elaborately equipped.

Figure 2 shows diagrammatically the difference between industrial-arts organization and vocational organization. The horizontal row of broad rectangles, all joined together, stands for the broad coverage of general fields found in a comprehensive industrial-arts program. The tall slivers represent sub-units out of each field, not connected up but each pursued separately as vocational training for a specific job, and studied thoroughly, in depth. Needless to say the two systems supplement and complement one another. (See AR Building Types Study, Vocational Schools, April, 1940.)

Within the industrial arts field taken by itself, there are conflicting views which the architect need not try to resolve. If the general shop space is well planned, it can normally be converted by successive teachers to meet their several interpretations of the concept.

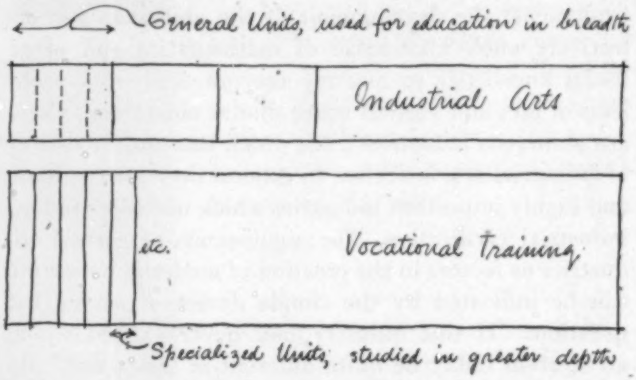

General Units, used for education in breadth
Industrial Arts
etc.
Vocational training
Specialized Units, studied in greater depth

Figure 2. Industrial arts education contrasted with vocational education (see text). The one works in breadth, the other, depth

Existing shops are notoriously dropped into the basement. This position will never do in new plans. Many industrial education supervisors would like to see the shop move at one bound from the cellar to the head of the class, occupying space opposite the main entrance. This arrangement, they argue, would put before visitors that part of the school, which is most directly concerned with the realities of present-day life, and would also provide for visually interesting display of student work. It is also argued that shop noises are no obstacle in the central position, because the entrance is a confused zone anyway, being surrounded usually by administrative offices, gym, and auditorium. A splendid example capitalizing shop display in such a situation is the Farmington High School, Flint, Mich., by Lyndon & Smith, Architects.

The contrary approach puts the shops in with other noisy areas at wing-ends — an excellent example is the Rhinebeck Central School, New York, now under construction, by Moore & Hutchins, Architects.

The shop cannot fit easily in a regulation classroom wing of conventional 22-ft. room width. The shop should stand at a wing-end, where it can absorb either the corridor width or the entire building width of 50 ft. or more; or else it may stand as a branch in itself.

CAROLA GREGOR Photo

PIX Photo

SIZE AND SHAPE

Methods of computation for size include (a) the use of a preliminary assumption based on recommended practices within the specified state; (b) modifications for local emphasis and available teaching force; (c) study of details by means of ¼-in. scale drawings or of templates representing equipment likely to be used.

Preliminary assumptions, expressed in square feet per pupil, are a very useful expedient, despite recent proclamations extolling the greater accuracy of starting the study with templates. The general assumption makes allowances for change — and not one shop in ten retains its exact original layout. Space allotments suggested by state departments vary widely, being generally cramped in those closely populated industrial states which also tend toward more progressive and comprehensive programs, and being more generous in other areas such as the South. Typical recommendations:

New York State: A basis of 75 sq. ft. gross interior area per pupil — approx. 1800 sq. ft. for a "well-planned shop for 25 pupils and 1 teacher."

Michigan: A *minimum* of 50 sq. ft. net area per pupil, excluding storage space, tool crib, finishing room, planning space. This average allowance to be progressively increased in *unit shops* as the number of pupils per room grows smaller.

Virginia: The gross interior area per student in general shops is put at 120 sq. ft. *minimum.*

Louisiana: Average area per pupil, as indicated in five suggested plan diagrams for comprehensive general shops of 16–20 pupils each, is 92 sq. ft. In a unit auto-mechanical shop for 20 pupils (50 by 70 ft.) the average is 187.5 sq. ft.; in unit machine shops or sheet metal shops (40 by 60 ft.) the allowance per pupil is 120 sq. ft.

Local variations according to industries prevailing in the region, or teaching skill available, affect the ultimate plan. Clay in Ohio, or textiles in New York.

The template method of spotting equipment is highly useful in obtaining the best ultimate shape and arrangement. Such templates may be obtained in two- or three-dimensional form from organizations such as Visual Production Planning, Inc., 101 Park Avenue, New York 17, N. Y. (see ¼-in. scale models on front cover). Templates can also be made of cardboard. See TSS, p. 119.

In shape, the industrial arts shop requires proportions somewhere between 1:1.5 and 1:2. L' and U's are officially frowned on as shapes because they are more difficult for one man to control.

GENERAL ROOM PLAN CONSIDERATIONS

It is assumed that architects and shop men alike are thoroughly familiar with the elementary principles of grouping different kinds of work together, and observing flow lines, so that the anvil is next to the forge and the circular saw near the lumber rack, etc. We list a few further principles:

1. Wood or fibrous floor, concrete floor: Many shops are so divided, and this controls the plan. On the concrete area are grouped activities having a fire hazard or using copious oil or water, e.g. hot metal work, ceramic furnace, mechanical repair shops. (See plans.)

2. Clean work, dirty work: This correlates to some degree with the above. The concrete floor tends to serve "dirty" work. It is an error to provide wood storage in this vicinity, where sparks, metal filings, oil, can become imbedded in boards on their way to the saw. The space division into areas of "clean" and "dirty" work gives rise to the use of glassed partitions to protect areas for graphic arts, planning, photography and the like from the dust that arises even from such clean work as wood and clay. (See especially plan for Hugh Morson High School, page 103.)

3. *Window area, inner floor area:* Most shop teachers seem to prefer having machinery such as lathes stand next to windows for natural lighting. In New York State, where more different kinds of activity are included than elsewhere, the supervisor believes that outer wall area is needed for storage under high windows, but some of the best active teachers seem to prefer full-sized windows.

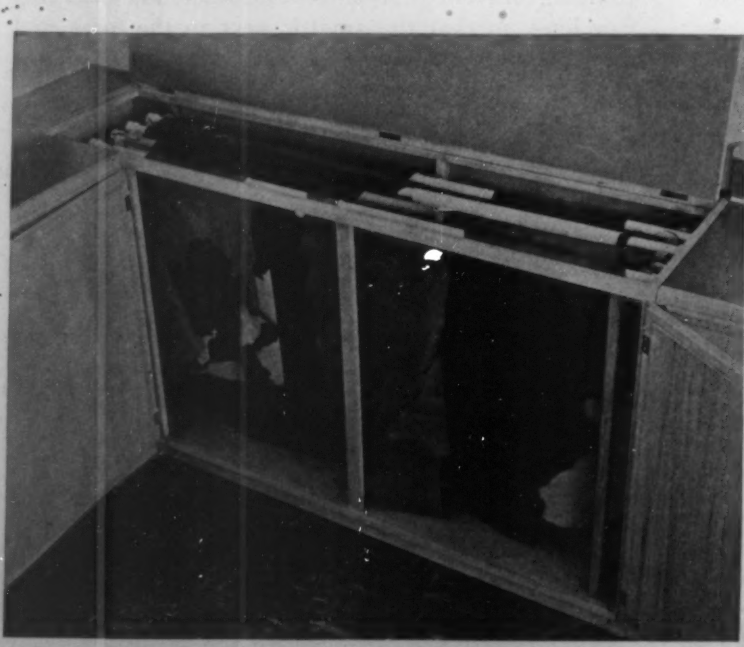
4. *Tool supply.* Tool rooms or bins requiring check-out have the disadvantage that half of the short time at the pupils' disposal is spent obtaining and returning tools, and that one pupil, placed in charge, loses that study period altogether. Apparently the best system is based on separate cabinets or, where possible, *open wall panels*, for each kind of work, close to that work. These are quickly controlled by one youngster in each area assigned to the job; misses are easily seen.

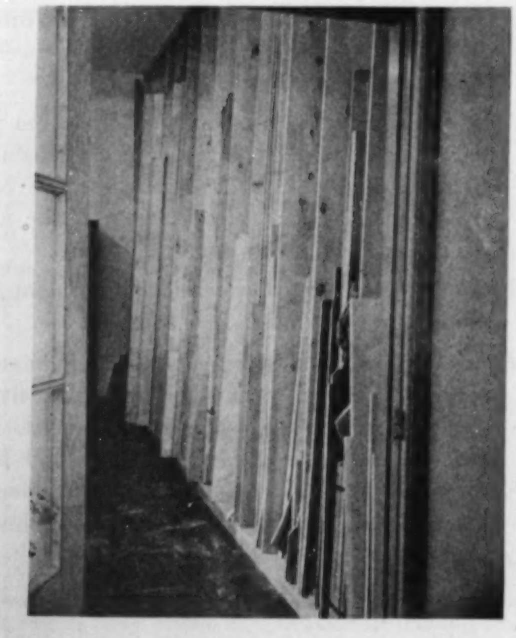
5. *Materials supply.* Vertical lumber storage conserves space, makes for easy removal. Disadvantages: lengths are restricted to 10 or 12 ft.; twisting is induced in some boards. Horizontal storage, usually on rows of pipes with ends inserted, at a slight slant, into vertical posts, holds longer pieces and preserves the shape of the lumber, but requires more careful organization. Metal sheets and strips are held in vertical open compartments. Other arts and crafts depend on local cabinet storage, along wall spaces, at columns, or under benches.

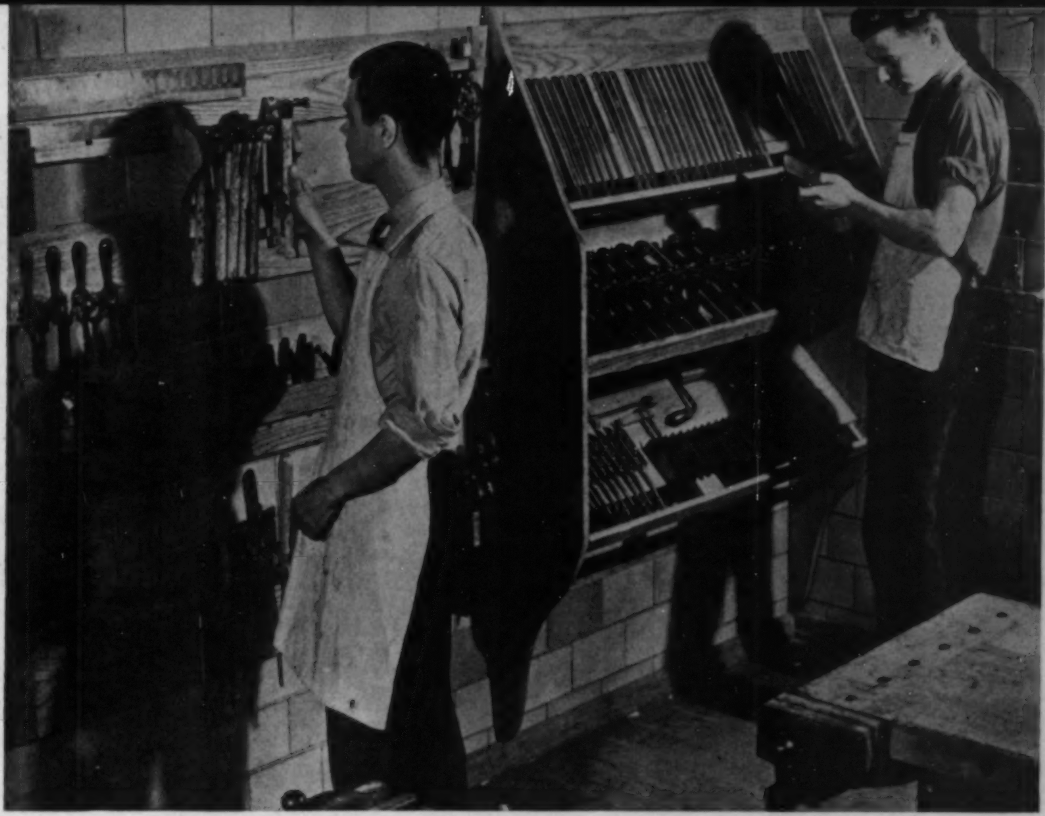
6. *Storage of work in progress. This is the provision which is most generally neglected or forgotten altogether.* Locker space is required for this in every department. One suggestion is the use of space under work benches, where shop teachers hate the usual useless tool drawers, would prefer having open storage space, reaching all the way down to the recessed base at the floor.

7. *"Planning center."* Whether elaborate or simple, this must afford a clear view of the whole shop for the teacher. The only kind requiring architectural preparation is that which is combined with a drafting, graphic arts, or other "clean" department behind a glass partition (see accompanying plans).

MATERIALS STORAGE (below). These photographs are from the Burris School, Muncie, Indiana (more fully illustrated, pages 100–102). Leather storage rack is seen at left, vertical lumber rack at right

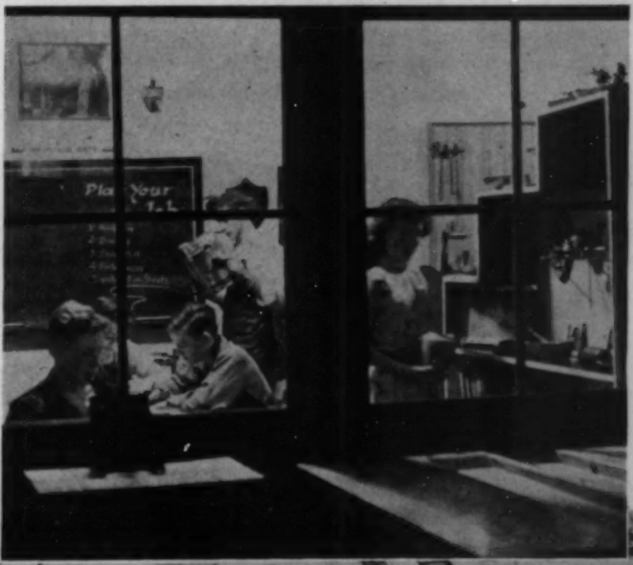


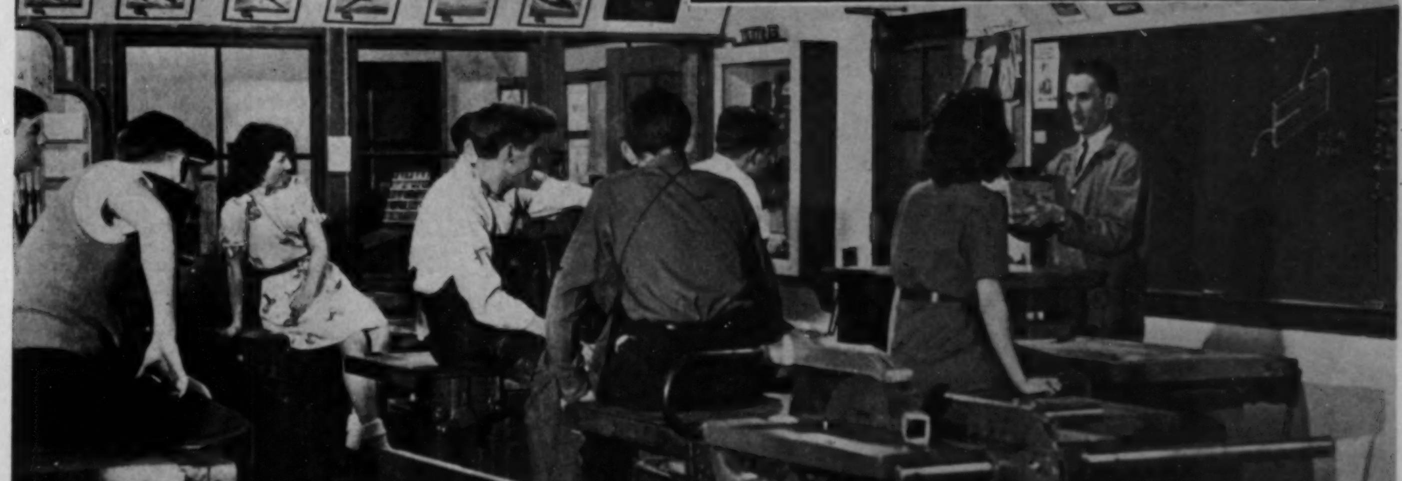




TOOL SUPPLY *(left and above). The use of a tool crib, as photographed in a trade school, is often frowned upon by the industrial arts teacher. His pupils have only short periods in shop, should get at tools instantly from open racks or panels, as seen above, right; one pupil can be delegated custodian of each rack. Storage of nails, etc., is seen in the example across-page*

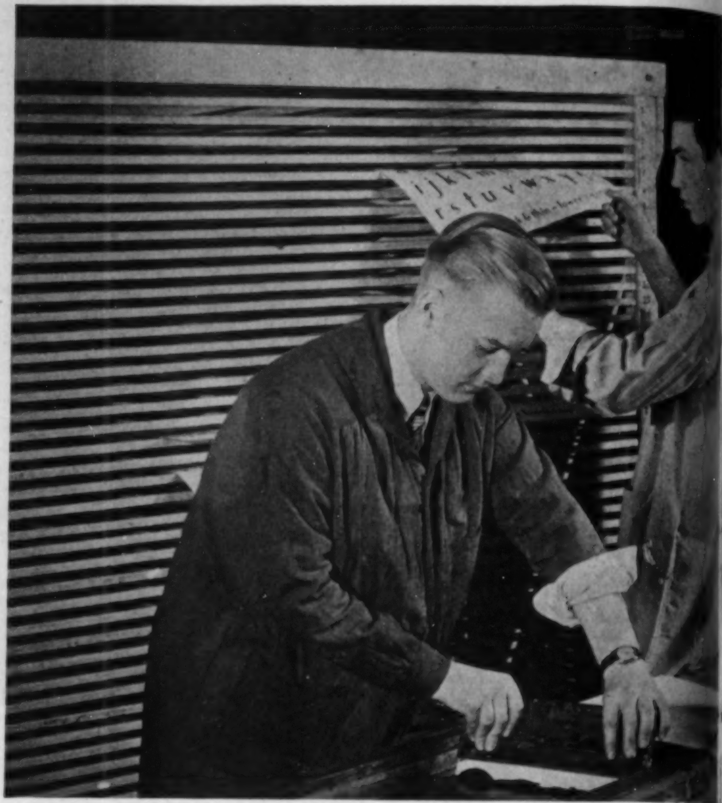
PLANNING AND PROJECTS CENTERS *(right and below). As mentioned in the text, it is natural and easy to let children sit on benches, as seen in the larger view, to observe a blackboard demonstration. In the smaller picture is a glimpse of the "planning center" behind the glass partition, where a girl is examining pottery from the "museum" and boys are planning at a desk with books. Both these views are from Bethlehem Central School of which the plan appears on page 104*





8. *Display.* Cabinets built into the wall, and facing the corridor outside the room, give a chance to display student work; other cabinets may be provided inside, always having glass fronts or doors as protection against ever-present dust. A great deal more display is required than is often realized. Interior walls, at least from a hard wainscot to the picture-rail height, should therefore be of a material that permits tacking. In the planning area, in addition to desks and other working necessities, there must be space for counters or open cupboards holding samples of ore, wood, clay, textiles, papers, and other materials of industry. This kind of space is valuable and must be insisted upon. If a sacrifice is to be made, the first thing to go should be pseudo-classroom space with seats or benches generally vacant. Pupils may sit on work benches instead, to listen to talks, preferring the informality of the situation.

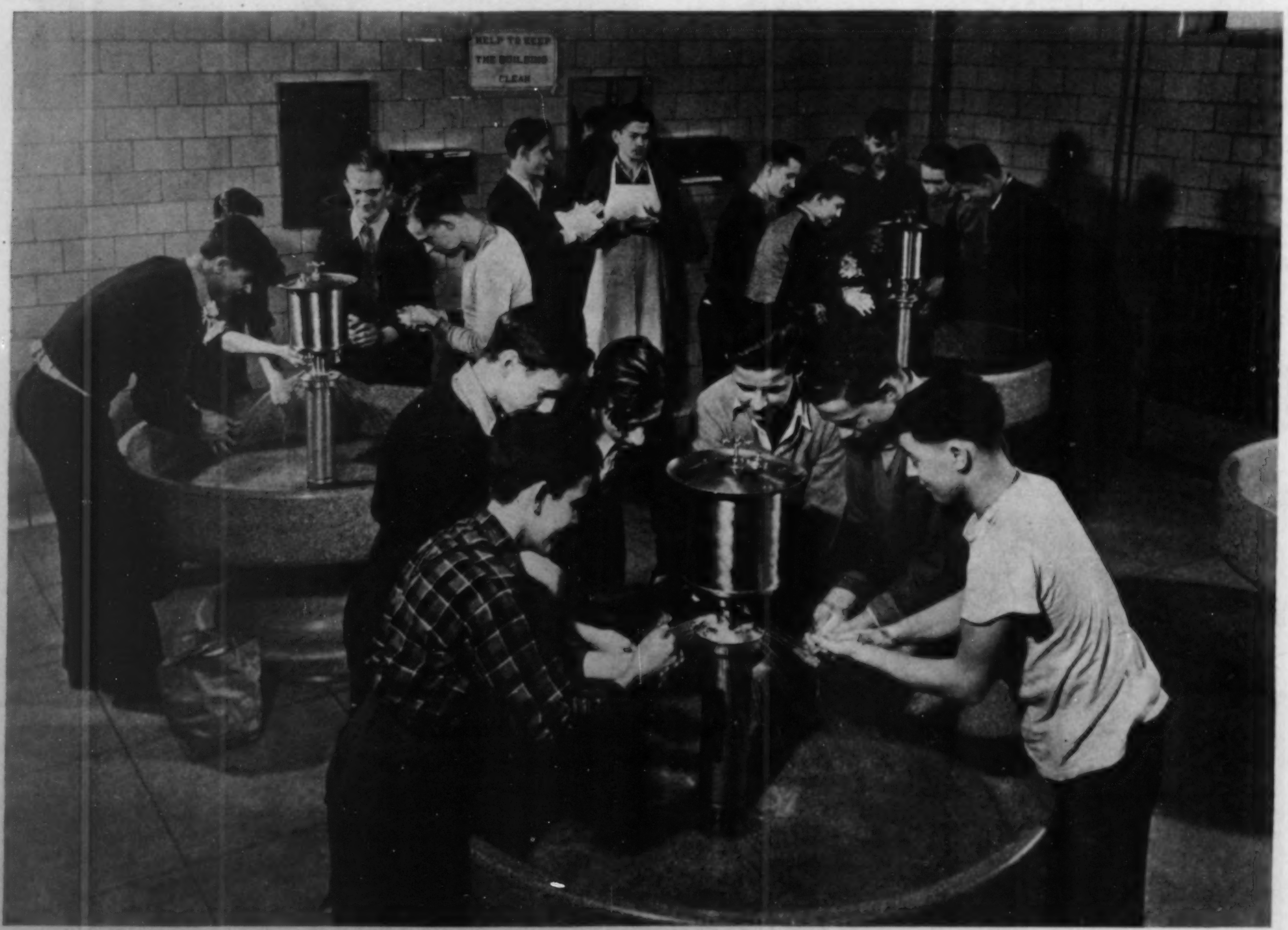
Photo Courtesy Federal Security Agency



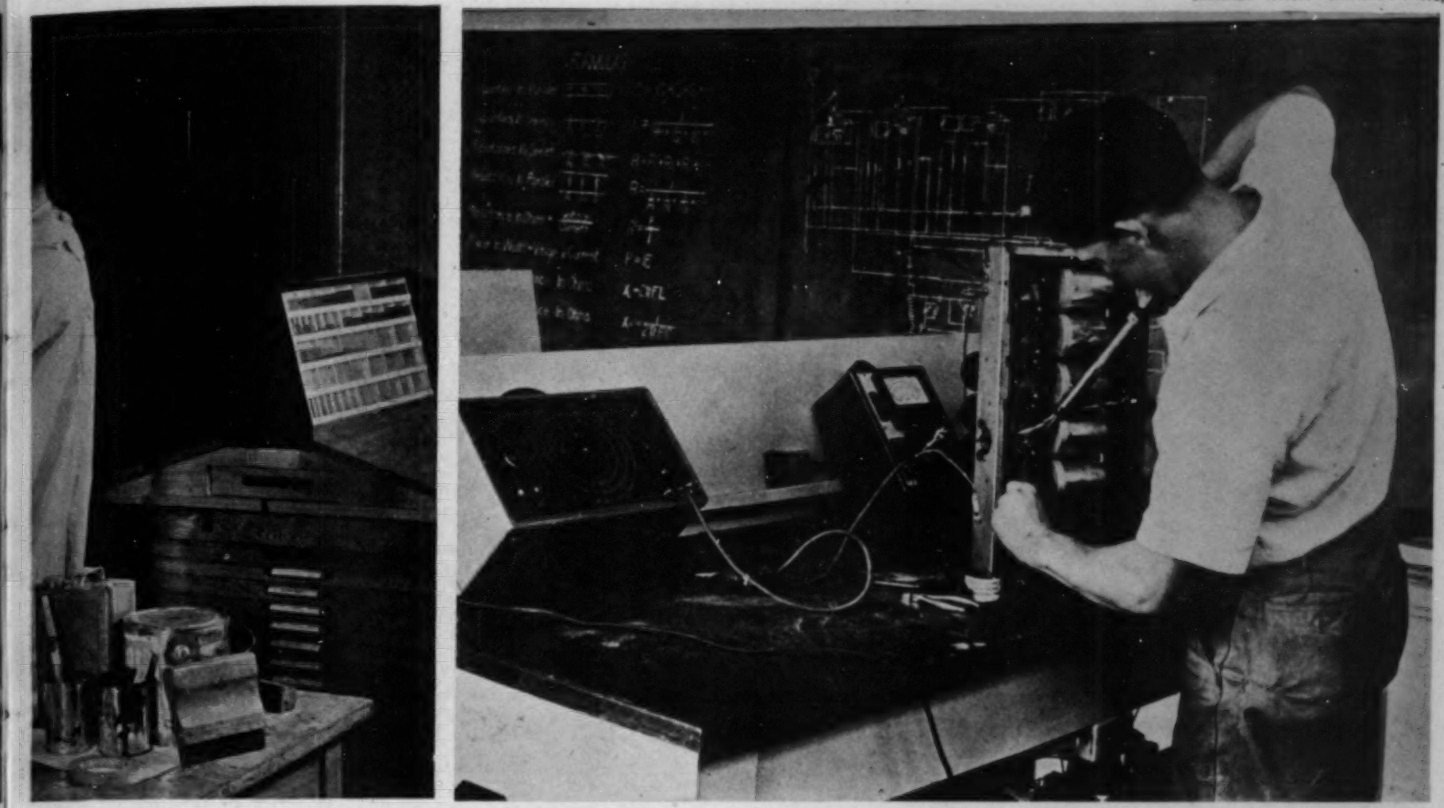
EQUIPMENT AND FINISHES

1. *Floor and wall finishes.* For general shop areas, the material in most common present-day use is hardwood, usually maple. Other materials: wood block, resilient tile, rubber (for more details see AR, April '40, p. 100.) Concrete is preferred in areas devoted to automobile mechanics, forge, heavy machine work. Walls should preferably have a wainscot 4 to 5 ft. high of a hard-finished material such as tile, which is easily maintained. Above this wainscot should be a bulletin-board

Below: The type of wash-up fountain used in regular industrial establishments is highly recommended for use in the larger school


HELP TO KEEP THE BUILDING CLEAN

BRADLEY WASH FOUNTAIN Photo



THE WIDE VARIETY OF CRAFTS taught is suggested in these two views. At left, silk-screen printing (School of Industrial Art, New York). Above: radio testing in the Eugene Vocational School, Eugene, Oregon. Industrial-arts equipment is similar

material such as soft wood, wall board, extending to the picture rail. Acoustical ceilings should provide minimum absorption of 35 per cent; 50–75 per cent preferred.

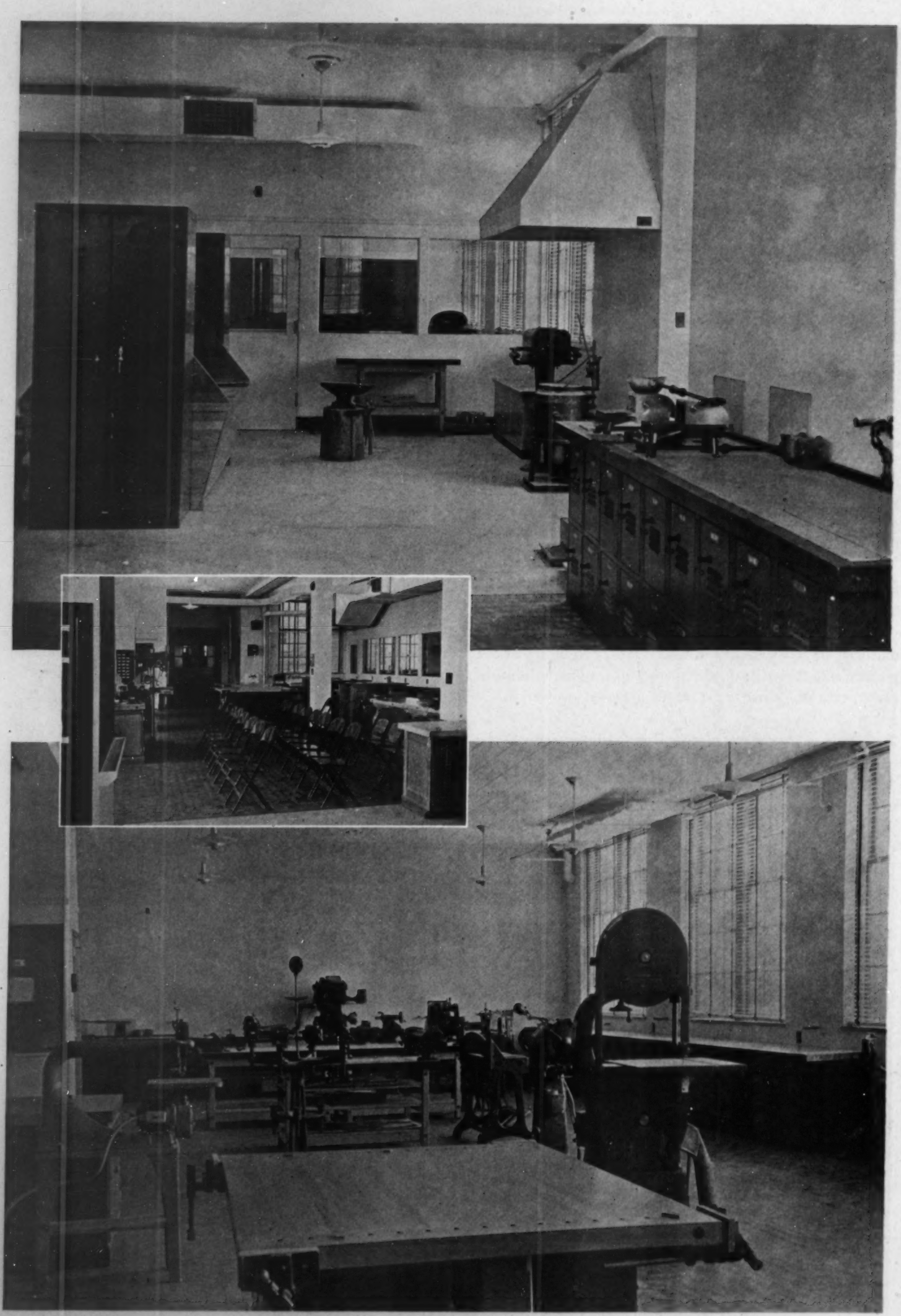
2. Outlets — power and electric. Inadequate wiring is the bane of the shop man. Minimum requirement in power outlets for the well planned shop is 110-volt outlets every 15 ft. around the shop. Adequate power wiring includes 220-volt outlets at about 10-ft. intervals along the outer wall, and under-floor to the central area containing tools such as the jointer, sander, power saw, band saw, wood planer, a possible metal planer. Height of wall outlets, 42 in. above floor. *Switch panels* have too often been placed in positions out of easy reach. A *red pilot light* is indispensable at or near the main switch.

Gas Outlets may be required at the metal heat-treating oven, the ceramic oven, the kitchen.

3. Lighting. The customary glass-globe fixture used throughout schools is too easily broken when hit by long boards, etc. Hence a preference for incandescent fixtures of concentric lowers, or fluorescent fixtures with cut-off baffles acting as protection. Local lights attached to machines are also easily hit by young pupils; might be replaced by spotlight provisions in the ceiling permitting direct illumination of critical machine parts. Lights recessed in the ceiling for general illumination have the disadvantage of creating excessive brightness contrasts with the dark ceiling unless supplemented by a few indirect lights of low power and wide spread used expressly to illuminate the ceiling itself and incidentally to soften the down light. For lighting levels, see IES Manual of Recommended School Practice.

4. Ventilation. Beyond the general requirement of 6 to 7½ changes of air per hour and 65F temperature with relative humidity of 30 to 60 per cent, there is needed a big exhaust fan to be used in connection with special noxious operations such as plating; also, where finishing rooms and materials storage are in dead interior space, mechanical ventilation should not be forgotten. The grouping of the forge, the heat-treating furnace for metals, and the ceramic oven near one another permits carrying the respective exhaust flues and chimneys out of the room together in a single stack, and supplying a single hood. The more elaborate shop in a big school may require forced evacuation of sawdust, shavings, etc., through under-floor flues.

5. Plumbing. An item all too frequently forgotten though urgently needed is a drinking fountain. Toilets need not be placed within the shop area. Highly desirable in larger shops is an industrial-type wash-up fountain. In comprehensive shops, the irreducible minimum wash-up facility is one deep sink, piped for hot and cold water. Cold water is needed in the graphic arts area for paints and paste; in wood-working for glue; in the ceramics area; in metal work at quench tubs. All shop sinks need extra large drains, and more especially big easy traps, since there is no other place where children can dispose of clogging materials such as clay, wax, grease, paint, plaster of Paris. If automobiles are to be driven into the shop, a floor drain is required in the concrete floor.



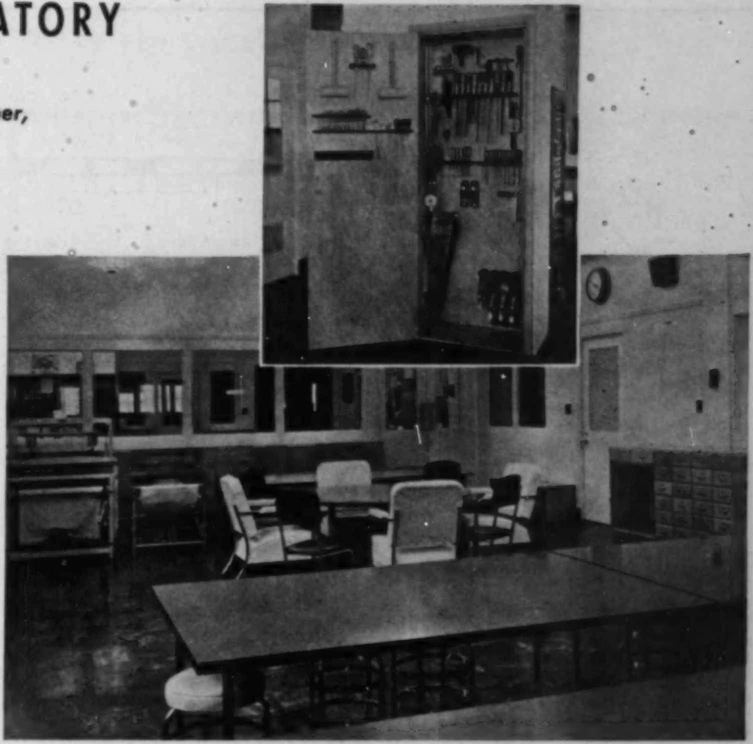
INDUSTRIAL ARTS LABORATORY

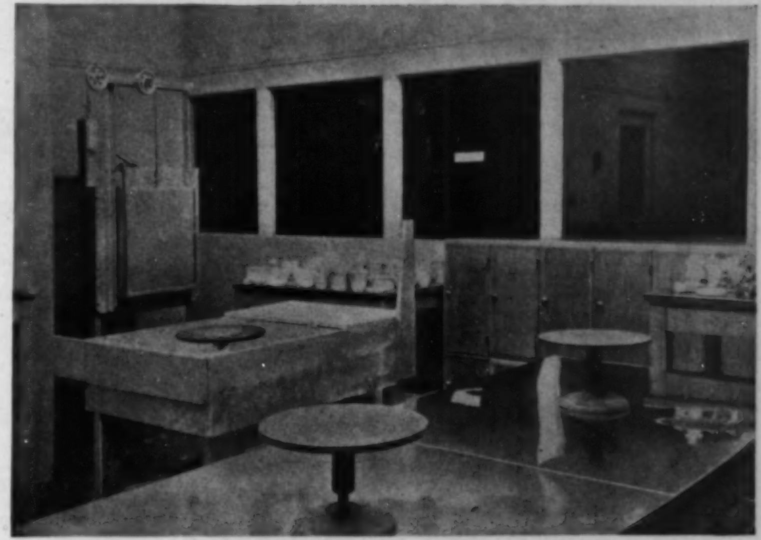
BURRIS SCHOOL, Muncie, Indiana; Herbert F. Smenner, Architect for the Shop Extension

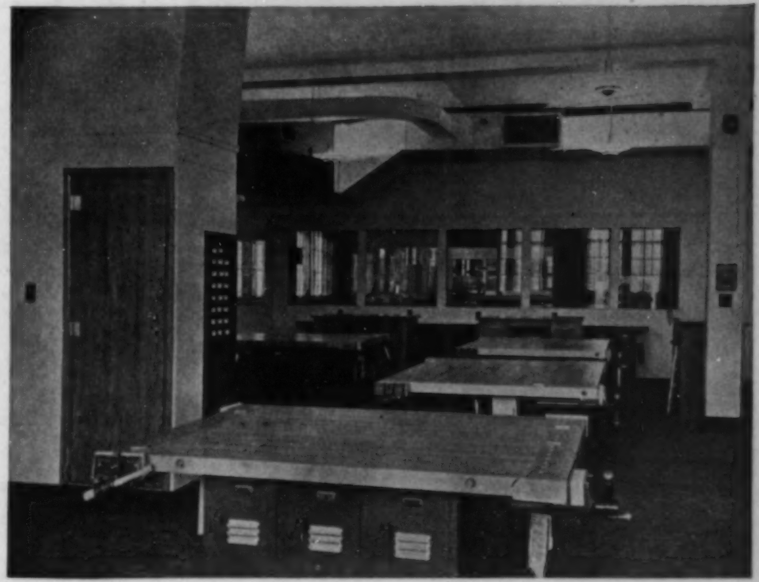
This arts workshop is a showplace of industrial arts education, connected with the Ball State Teachers College. Dr. Fred C. Schmidt, Jr., was consultant in preparing the plan. Its scope is far broader than most. The purpose is to relate all "The Arts," including fine arts, household arts and industrial arts. There is also the desire that boys have a taste of household arts, girls of industrial ones.

The plan (next page) mirrors the belief in coeducation, and also belief in stimulating the pupil's own interest so that he spends a major part of his industrial-arts time in occupations which he finds to his liking. Note that there are no formal corridors or passageways through the area. In getting from one part to another the boy or girl has options of routes that lead past all the variety of work offered. The planning principle is the same that is used by the department store which seeks to intrigue customers into exploring all the component shops. The plan has been criticized for having too many partitions, though glass has been introduced in many of those which the plan marks solid (see photographs). The justification for the use of glass partitions is the desire to break down the physical barriers between various subject-matter areas.

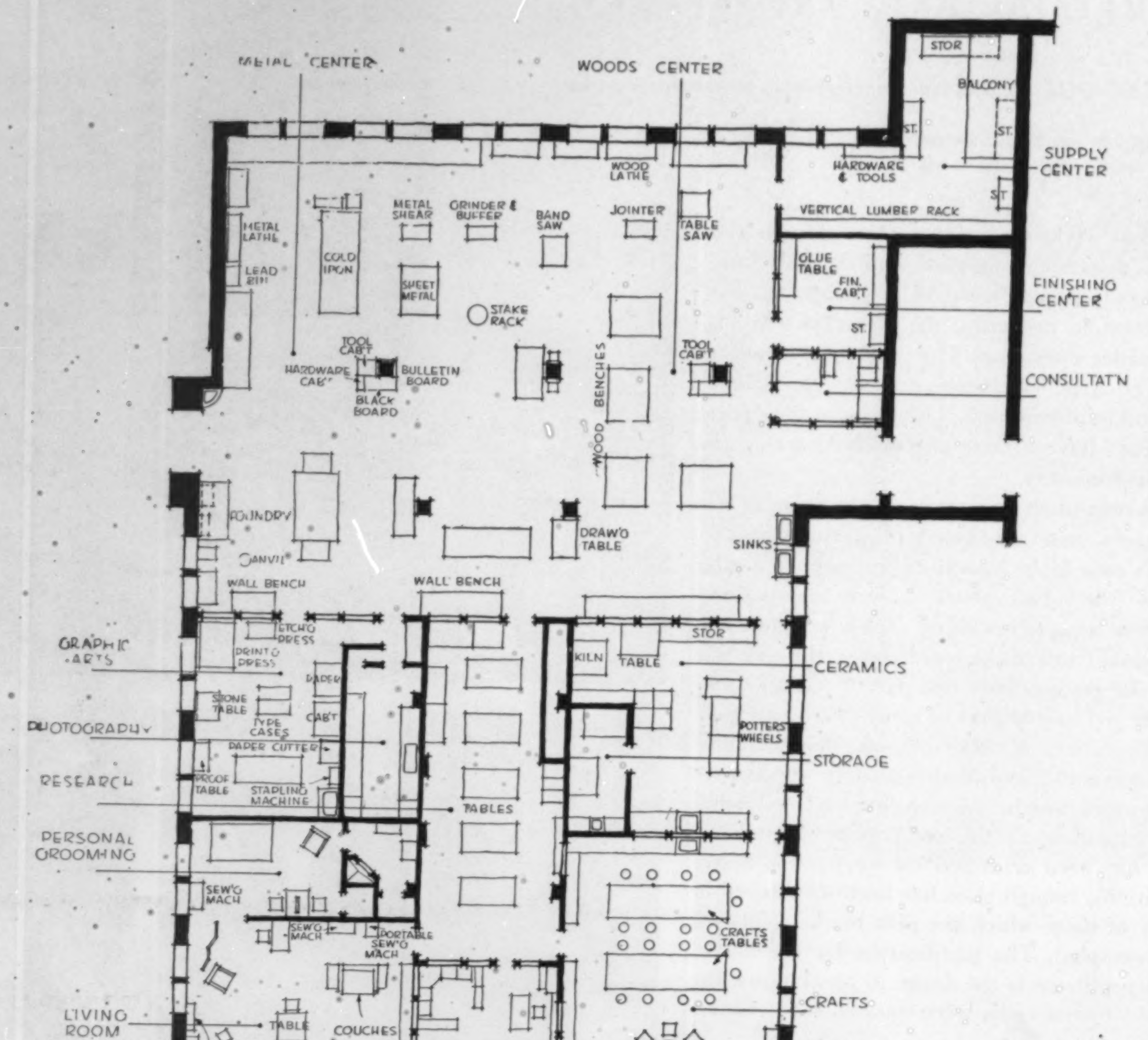
Color presented an unusual problem because of the openness of the plan through the use of glass partitions. Harmony had to be maintained although distinctiveness in color was sought for each area. Pastel shades were finally selected, cool for south and west exposures, warm for north.





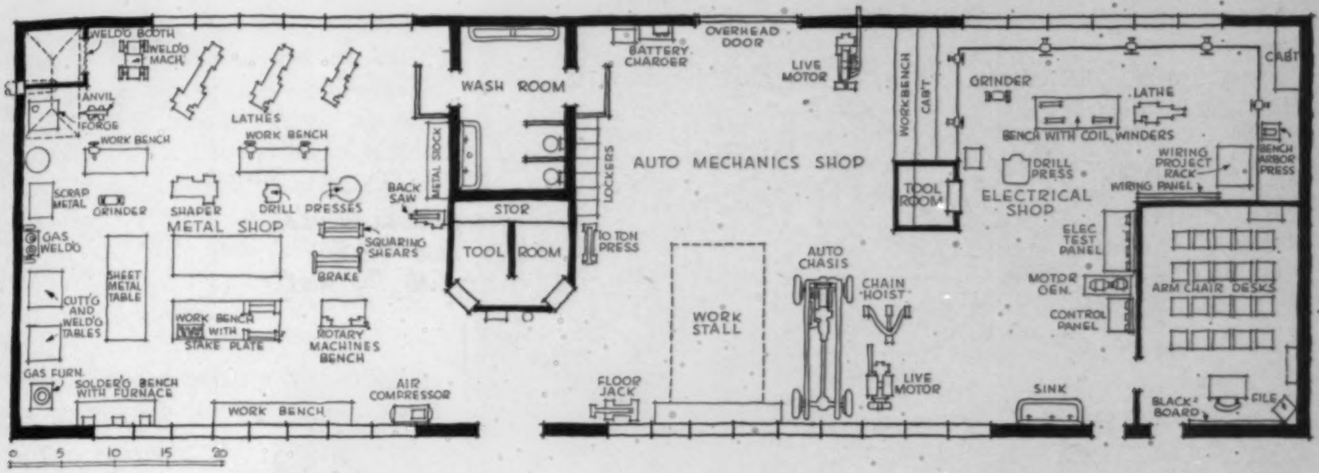


THE PHOTOGRAPHS illustrate various parts of the Burris School interior. In the metals room shown at the top of the page opposite, note concrete floor, and wood floor in contiguous forward area. The lockers hold student work in progress. Hood is needed over furnace to remove noxious gases; duct against ceiling at rear is part of regular ventilation system. On this page, from top to bottom: a tool cabinet built in with vertical ventilator shaft; consultation and storage space in crafts area; the ceramics shop with furnace and potters' wheels; part of the woodworking shop


METAL CENTER
WOODS CENTER
STOR
BALCONY
ST.
ST.
ST.
SUPPLY CENTER
HARDWARE & TOOLS
VERTICAL LUMBER RACK
WOOD LATHE
METAL LATHE
LEAD BIN
COLD IRON
METAL SHEAR
GRINDER & BUFFER
BAND SAW
JOINTER
TABLE SAW
SHEET METAL
STAKE RACK
GLUE TABLE
FIN. CAB'T
FINISHING CENTER
ST.
TOOL CAB'T
HARDWARE CAB'T
BULLETIN BOARD
BLACK BOARD
TOOL CAB'T
WOOD BENCHES
CONSULTAT'N
FOUNDRY
ANVIL
DRAW'G TABLE
SINKS
WALL BENCH
WALL BENCH
GRAPHIC ARTS
ETCH'G PRESS
PRINT'G PRESS
PAPER
STONE TABLE
TYPE CASES
CAB'T
PHOTOGRAPHY
PAPER CUTTER
RESEARCH
PROOF TABLE
STAPLING MACHINE
TABLES
KILN
TABLE
STOR
CERAMICS
POTTERS WHEELS
STORAGE
PERSONAL GROOMING
SEW'G MACH
SEW'G MACH
PORTABLE SEW'G MACH
CRAFTS TABLES
CRAFTS
LIVING ROOM
TABLE
COUCHES
LIBRARY
SEWING MACHINES
BOOKCASES
DINING
PORTABLE SEW'G MACH
STORAGE
GAS RANGE
DRESS'G TABLE
DESK
CONSULTAT'N
KITCHEN
ELEC RANGE
FILE
LAUND TRAYS
LAUNDRY
RANGE
SINK
REF
IRON'G BOARDS
WORK TABLE
MANGLE
STORAGE
DRAWING TABLES
STUDIO
CONSULTAT'N
FILE
DESK
DESK
BOOKS
FILE
CONSULTAT'N
EXHIBITS
STORAGE
0
5
10
15
DISPLAY

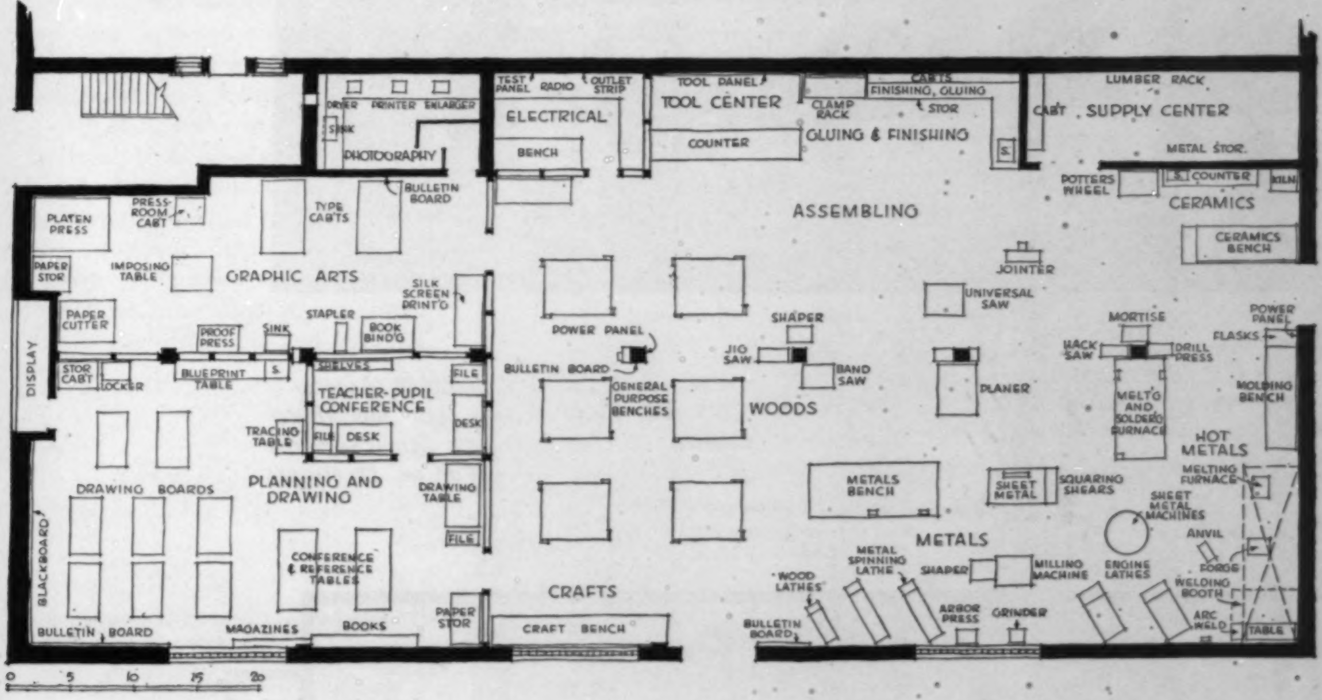
PLAN OF THE BURRIS SCHOOL, Muncie, Indiana — see text discussion and photographs on preceding pages

SUGGESTED ARRANGEMENT BY TEXAS STATE BOARD FOR VOCATIONAL EDUCATION


WELD'G BOOTH
WELD'G MACH.
LATHES
ANVIL
FORGE
WORK BENCH
WORK BENCH
SCRAP METAL
GRINDER
SHAPER
DRILL PRESSES
METAL SHOP
GAS WELD'G
SHEET METAL TABLE
SQUARING SHEARS
BRAKE
CUTT'G AND WELD'G TABLES
WORK BENCH WITH STAKE PLATE
ROTARY MACHINES BENCH
GAS FURN.
SOLDER'G BENCH WITH FURNACE
WORK BENCH
AIR COMPRESSOR
WASH ROOM
METAL STOCK
BACK SAW
STOR
TOOL ROOM
LOCKERS
BATTERY CHARGER
OVERHEAD DOOR
LIVE MOTOR
AUTO MECHANICS SHOP
10 TON PRESS
WORK STALL
AUTO CHASIS
CHAIN HOIST
LIVE MOTOR
FLOOR JACK
WORKBENCH
CAB'T
TOOL ROOM
GRINDER
LATHE
BENCH WITH COIL WINDERS
DRILL PRESS
WIRING PROJECT RACK
WIRING PANEL
ELECTRICAL SHOP
CAB'T
BENCH ARBOR PRESS
ELEC TEST PANEL
MOTOR GEN.
CONTROL PANEL
ARM CHAIR DESKS
SINK
BLACK BOARD
FILE
0 5 10 15 20

This suggested plan was made for a vocational shop but illustrates principles that apply to industrial-arts shops as well. In good arrangement there are three related unit shops which have the character of general training. The metal shop and the electrical shop both serve the auto shop which stands between them. This more limited selection of fields of work is advocated by some industrial-arts teachers. An automobile, they say, contains a power plant, electrical system, radio, plumbing system; it demands sheet-metal work, woodwork, ceramics in spark plugs at least; indeed, it involves almost every shop activity but printing

HUGH MORSON HIGH SCHOOL, Raleigh, N. C., William Henley Deitrick, Architect

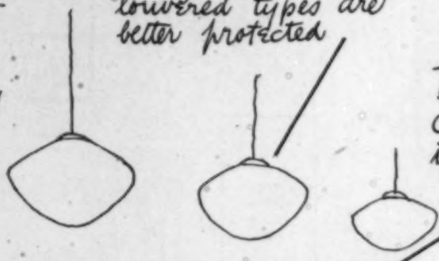

DRYER
PRINTER
ENLARGER
SINK
PHOTOGRAPHY
TEST PANEL
RADIO
OUTLET STRIP
ELECTRICAL
BENCH
TOOL PANEL
TOOL CENTER
COUNTER
CLAMP RACK
CAB'TS
FINISHING, GLUING
STOR
GLUING & FINISHING
S.
CAB'T
LUMBER RACK
SUPPLY CENTER
METAL STOR.
PLATEN PRESS
PRESS-ROOM CAB'T
TYPE CAB'TS
BULLETIN BOARD
POTTERS WHEEL
COUNTER
KILN
CERAMICS
ASSEMBLING
CERAMICS BENCH
PAPER STOR
IMPOSING TABLE
GRAPHIC ARTS
SILK SCREEN PRINT'G
JOINTER
UNIVERSAL SAW
PAPER CUTTER
PROOF PRESS
SINK
STAPLER
BOOK BIND'G
POWER PANEL
SHAPER
MORTISE
POWER PANEL
FLASKS
DISPLAY
STOR CAB'T
LOCKER
BLUEPRINT TABLE
S.
SHELVES
FILE
BULLETIN BOARD
JIG SAW
BAND SAW
BACK SAW
DRILL PRESS
TEACHER-PUPIL CONFERENCE
GENERAL PURPOSE BENCHES
WOODS
PLANER
MELT'G AND SOLDER'G FURNACE
MOLDING BENCH
TRACING TABLE
FILE
DESK
DESK
HOT METALS
DRAWING BOARDS
PLANNING AND DRAWING
DRAWING TABLE
METALS BENCH
SHEET METAL
SQUARING SHEARS
MELTING FURNACE
SHEET METAL MACHINES
FILE
METALS
BLACKBOARD
CONFERENCE & REFERENCE TABLES
ANVIL
METAL SPINNING LATHE
WOOD LATHES
SHAPER
MILLING MACHINE
ENGINE LATHES
FORGE
WELDING BOOTH
CRAFTS
ARC WELD
BULLETIN BOARD
MAGAZINES
BOOKS
PAPER STOR
CRAFT BENCH
BULLETIN BOARD
ARBOR PRESS
GRINDER
TABLE
0 5 10 15 20

A comprehensive general shop for industrial-arts use that is less cut up by partitions than the Burris School plan, and arranged with great competence. There are fewer departments. Note that hot metals are concentrated in a corner where there is a concrete floor and a common hood for exhausts and chimney. The ceramics area, the other item of "dirty work," is at the same end of the shop, which is graded in plan from "dirty" to "clean." Glassed-in enclosures protect graphic arts, photography, and planning and drawing (note display cabinet toward corridor). The use of a tool center is open to question, some teachers preferring open panels of tools near each kind of work. The shop teacher instrumental in planning was C. Merrill Hamilton

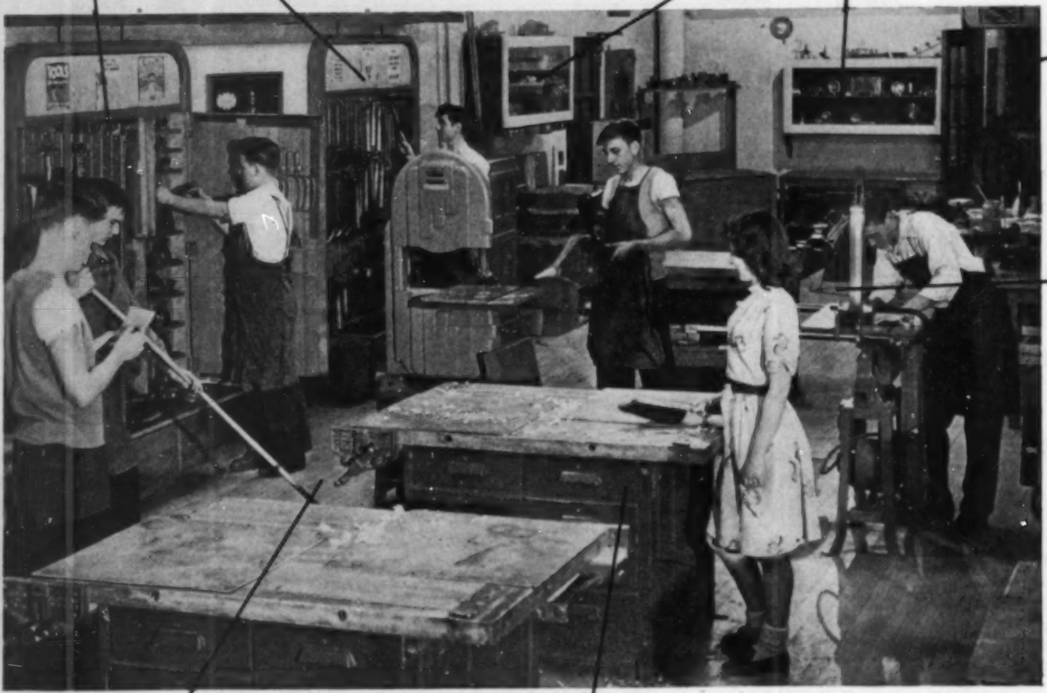
BETHLEHEM CENTRAL SCHOOL, DELMAR, NEW YORK

Separate tool panels for different kinds of material, easily supervised by one pupil for each section. Open arrangement quickly checked visually by teacher. No time lost at a "tool crib"

Glass-bowl fixtures are easily destroyed—louvered types are better protected



Display cases would create less clutter if built into the wall

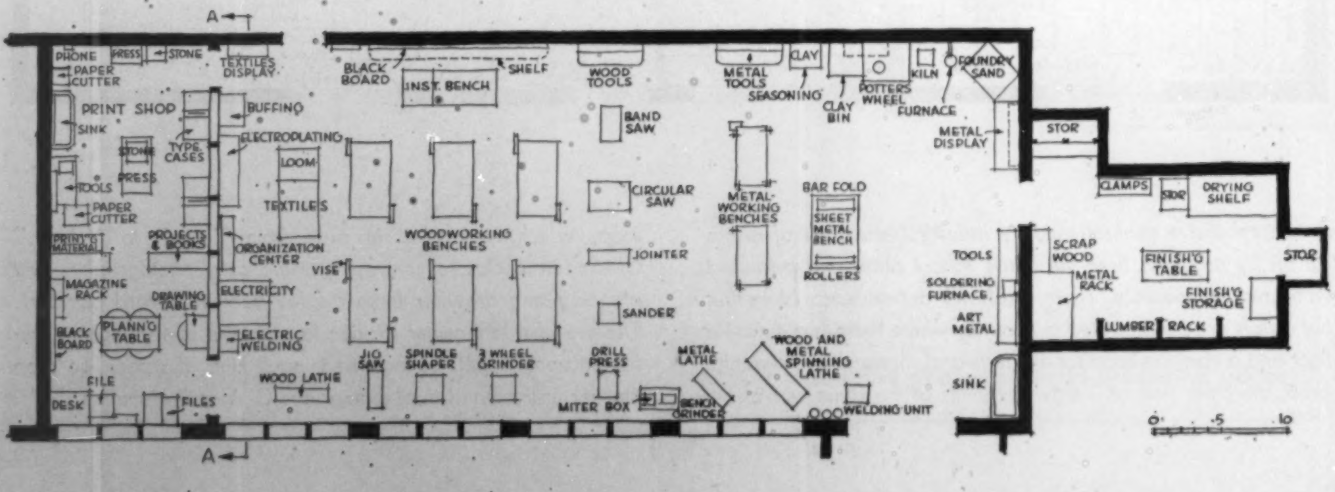


Storage areas need ventilation

Concrete floor in hot-metals area

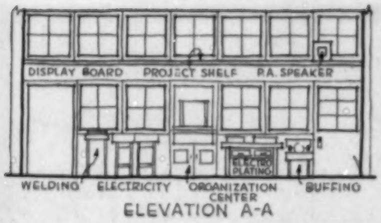
Maple floor in main area is well liked by teacher

These drawers are useless, since tools are kept hung up. This space should be divided into large sections for the storage of works in progress

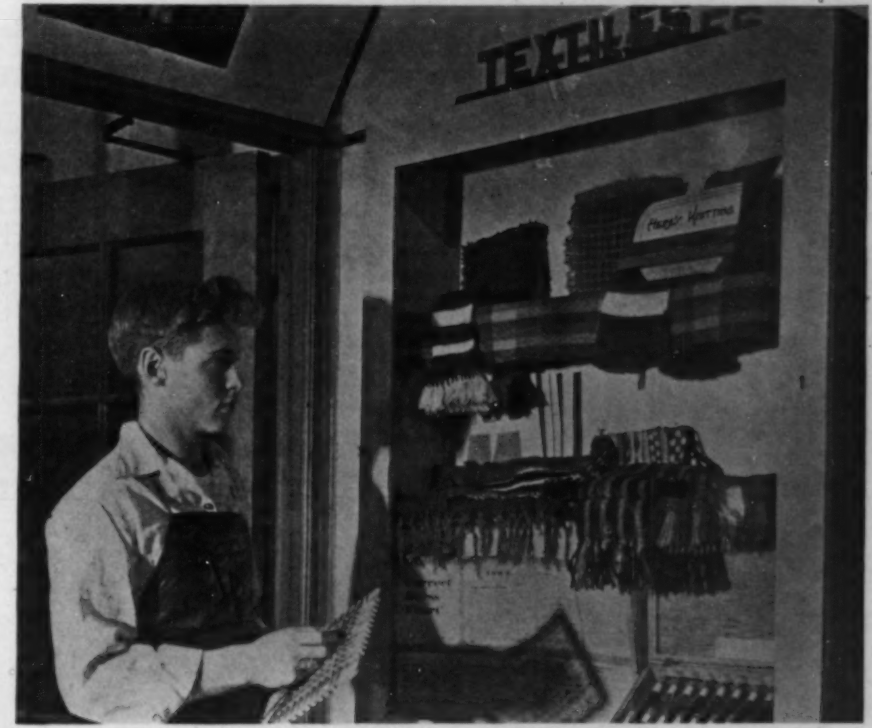

A
PHONE
PRESS
STONE
TEXTILES DISPLAY
PAPER CUTTER
PRINT SHOP
SINK
STONE
PRESS
TYPE CASES
TOOLS
PAPER CUTTER
PRINT'G MATERIAL
PROJECTS & BOOKS
MAGAZINE RACK
DRAWING TABLE
BLACK BOARD
PLANN'G TABLE
FILE
DESK
FILES
BUFFING
ELECTROPLATING
LOOM
TEXTILES
ORGANIZATION CENTER
ELECTRICITY
ELECTRIC WELDING
WOOD LATHE
BLACK BOARD
SHELF
INST. BENCH
WOODWORKING BENCHES
VISE
JIG SAW
SPINDLE SHAPER
3 WHEEL GRINDER
WOOD TOOLS
BAND SAW
CIRCULAR SAW
JOINTER
SANDER
DRILL PRESS
MITER BOX
BENCH GRINDER
METAL LATHE
METAL TOOLS
SEASONING
CLAY
CLAY BIN
POTTERS WHEEL
KILN
FURNACE
FOUNDRY SAND
METAL-WORKING BENCHES
BAR FOLD
SHEET METAL BENCH
ROLLERS
WOOD AND METAL SPINNING LATHE
WELDING UNIT
METAL DISPLAY
TOOLS
SOLDERING FURNACE
ART METAL
SINK
STOR
CLAMPS
STOR
DRYING SHELF
SCRAP WOOD
METAL RACK
FINISH'G TABLE
STOR
FINISH'G STORAGE
LUMBER RACK
0
5
10
A

SPECIAL ACKNOWLEDGMENT for help in preparing this study is made to Mr. Neuthardt (whose shop is seen on these two pages) and who has kindly lent photographs which are to appear in a forthcoming book on industrial arts education); to Mr. Fred Strickler of Teachers College, Columbia University, and to Mr. Roy G. Fales, Supervisor of Industrial Education, N. Y. State Education Dept.

This busy shop has a high-ranking reputation among school men. The room is a little too long and narrow to meet the highest standards as now postulated, but the teacher, Mr. Emerson E. Neuthardt, has made the most of it. The interior views (there are others on page 97) suggest how much more goes into such a shop than we are accustomed to see in photographs of architects' designs just finished and not yet used. A part of the characteristic clutter of school shops arises out of the vestigial affection for "peasant art" and "arts and crafts" of teachers who have not emotionally graduated into the industrial epoch; but a part of it arises out of the need for much more display than school boards have included in building programs presented to architects. This "museum" display, along with display of finished student work, should be integrated in the room plan along with tools and material storage.

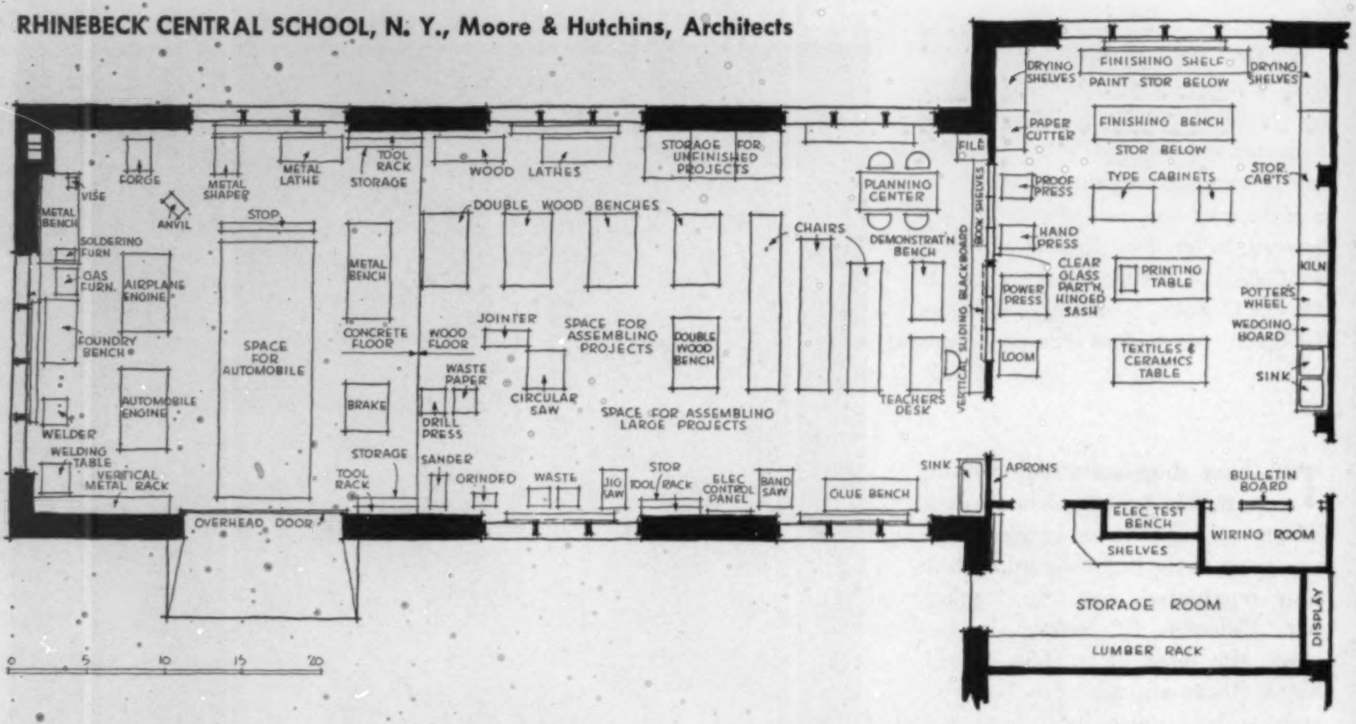


ELEVATION A-A

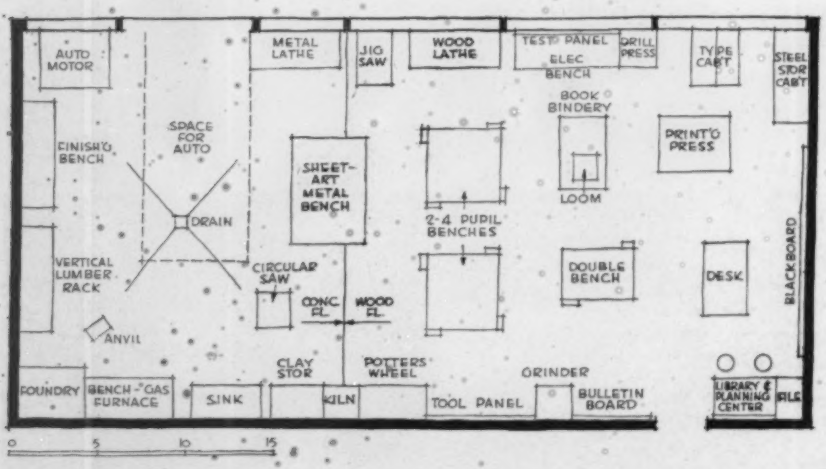


PHOTOGRAPHS on these two pages are from the Bethlehem Central School and show details of an industrial arts shop in successful operation. The textile display (above) is close to the planning center (and may be picked out in the general view, bottom of page 97) — an essential element of the good shop. The hot metals area (below) has a concrete floor; metals of relatively low melting point are used. The elevation (left) shows the organization center at A-A in plan with overhead show space for finished projects

RHINEBECK CENTRAL SCHOOL, N. Y., Moore & Hutchins, Architects


FORGE
METAL SHAPER
METAL LATHE
TOOL RACK
STORAGE
WOOD LATHES
STORAGE FOR UNFINISHED PROJECTS
PLANNING CENTER
FILE
BOOK SHELVES
DRYING SHELVES
FINISHING SHELF
PAINT STOR BELOW
DRYING SHELVES
PAPER CUTTER
FINISHING BENCH
STOR BELOW
PROOF PRESS
TYPE CABINETS
STOR CAB'TS
VISE
METAL BENCH
ANVIL
STOP
DOUBLE WOOD BENCHES
CHAIRS
DEMONSTRAT'N BENCH
HAND PRESS
SOLDERING FURN
GAS FURN.
AIRPLANE ENGINE
METAL BENCH
CLEAR GLASS PART'N HINGED SASH
PRINTING TABLE
KILN
POWER PRESS
POTTER'S WHEEL
WEDGING BOARD
FOUNDRY BENCH
SPACE FOR AUTOMOBILE
CONCRETE FLOOR
WOOD FLOOR
JOINTER
SPACE FOR ASSEMBLING PROJECTS
DOUBLE WOOD BENCH
VERTICAL SLIDING BLACKBOARD
LOOM
TEXTILES & CERAMICS TABLE
SINK
AUTOMOBILE ENGINE
WASTE PAPER
BRAKE
DRILL PRESS
CIRCULAR SAW
SPACE FOR ASSEMBLING LARGE PROJECTS
TEACHERS DESK
WELDER
WELDING TABLE
STORAGE
SANDER
VERTICAL METAL RACK
TOOL RACK
GRINDER
WASTE
JIG SAW
STOR TOOL RACK
ELEC CONTROL PANEL
BAND SAW
GLUE BENCH
SINK
APRONS
BULLETIN BOARD
OVERHEAD DOOR
ELEC TEST BENCH
SHELVES
WIRING ROOM
STORAGE ROOM
DISPLAY
LUMBER RACK
0
5
10
15
20

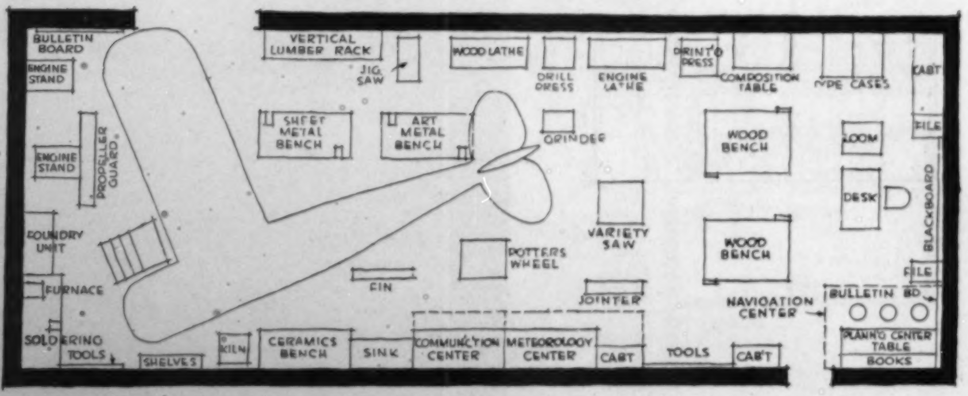
A fine example of a shop occupying a separate one-story wing which secures bilateral natural daylighting, easy access for deliveries (including access for automobiles to be worked on), and easy sound isolation from the rest of the building. (Lumber storage space acts as a natural sound barrier between the shop and the arts room next door.) A comprehensive general shop including more activities than most


AUTO MOTOR
METAL LATHE
JIG SAW
WOOD LATHE
TEST PANEL
ELEC BENCH
DRILL PRESS
TYPE CAB'T
STEEL STOR CAB'T
BOOK BINDERY
FINISH'G BENCH
SPACE FOR AUTO
SHEET-ART METAL BENCH
PRINT'G PRESS
LOOM
DRAIN
2-4 PUPIL BENCHES
BLACKBOARD
VERTICAL LUMBER RACK
CIRCULAR SAW
DOUBLE BENCH
DESK
CONC. FL.
WOOD FL.
ANVIL
CLAY STOR
POTTERS WHEEL
GRINDER
FOUNDRY
BENCH-GAS FURNACE
SINK
KILN
TOOL PANEL
BULLETIN BOARD
LIBRARY & PLANNING CENTER
FILE
0
5
10
15

The New York State Education Department advocates industrial arts shops of an extremely comprehensive type, based on the idea that children should explore the whole industrial environment (a far higher percentage of children in this state will go, for example, into printing or textiles than into woodworking; and if the youngster goes into no industry at all, it will still be true that these occupations engross a high percentage of his neighbors). Another purpose, especially in junior high schools, is to test the whole series of the child's aptitudes. The plan at the left is one of a graduated series in four steps to take care of classes from 10 to 25

NEW YORK STATE SUGGESTED PLANS

Based on existing buildings, not on ideal setups, the plan above is uncommonly tight in its provision for 16 children. In an area 22 by 50 ft., it accommodates tools for no less than 10 fields of industrial operation. The example at the right suggests methods of introducing aeronautical study in an area somewhat larger and used as a comprehensive shop. Few states use such ramifying programs


BULLETIN BOARD
ENGINE STAND
VERTICAL LUMBER RACK
JIG SAW
WOOD LATHE
DRILL PRESS
ENGINE LATHE
PRINT'G PRESS
COMPOSITION TABLE
TYPE CASES
CAB'T
PROPELLER GUARD
SHEET METAL BENCH
ART METAL BENCH
GRINDER
WOOD BENCH
LOOM
FILE
ENGINE STAND
DESK
BLACKBOARD
FOUNDRY UNIT
VARIETY SAW
WOOD BENCH
POTTERS WHEEL
FILE
FURNACE
FIN
JOINTER
NAVIGATION CENTER
BULLETIN BD
SOLDERING TOOLS
SHELVES
KILN
CERAMICS BENCH
SINK
COMMUNICATION CENTER
METEOROLOGY CENTER
CAB'T
TOOLS
CAB'T
PLAN'G CENTER TABLE
BOOKS

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

REFLECTION FACTORS IN STORE WINDOWS

By Kenneth C. Welch,* A.I.A., I.E.S.

THE familiar problem of combating reflections on store-front windows is becoming more important because of the present trend toward the open-front store. Glass fronts often reflect strongly lighted buildings or sky with the result that the glass appears to be covered with a "veiling glare," and pedestrians are reflected as in a mirror.

Formerly, strong lighting could be used within the window to overcome reflections, but the open-front store cannot be as highly illuminated as a "boxed-in" window.

Show windows, with backgrounds and theater-lighting, can be a large item of expense. Consequently, merchants are discounting their face value, rating them in proportion to the amount of pedestrian traffic which passes by the site, without entering, and to the need for displaying upstairs merchandise. This occurs to the greatest degree, of course, in existing metropolitan central districts.

In large shopping goods stores on the fringe of such districts, and in certain suburban locations, which sometimes pull through their doors as many as 90 per cent of the women who contact them,

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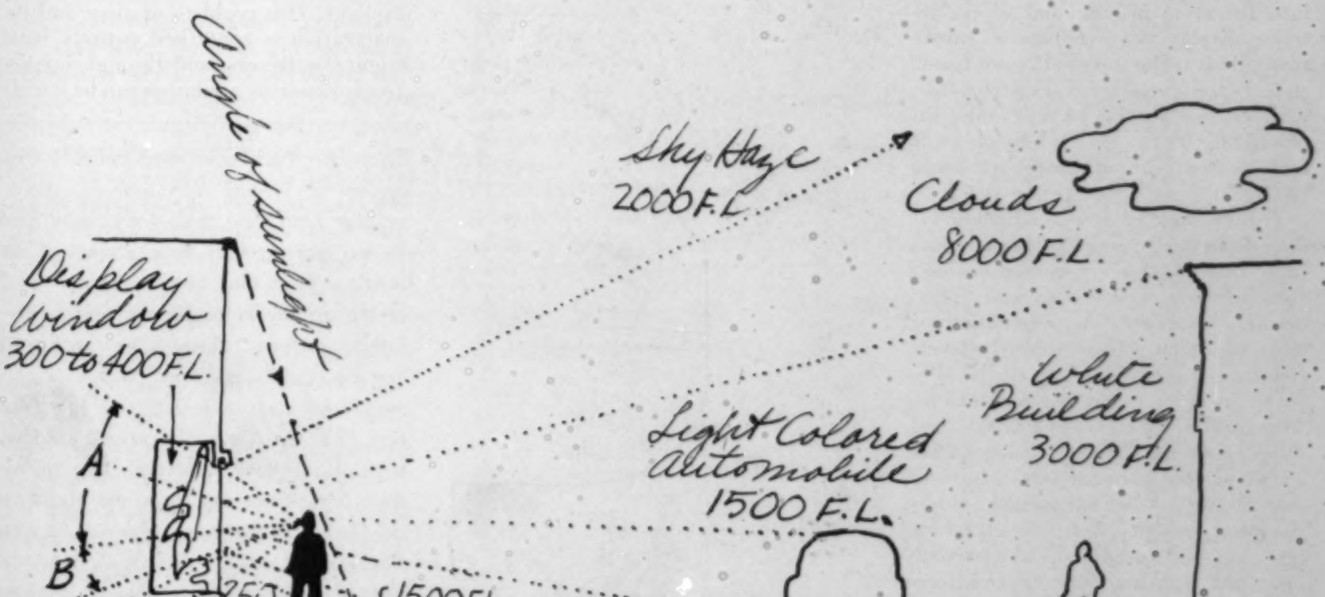
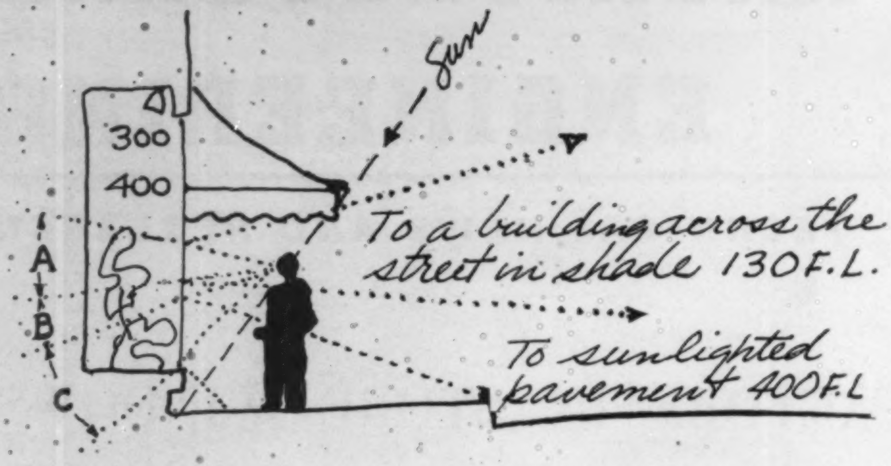
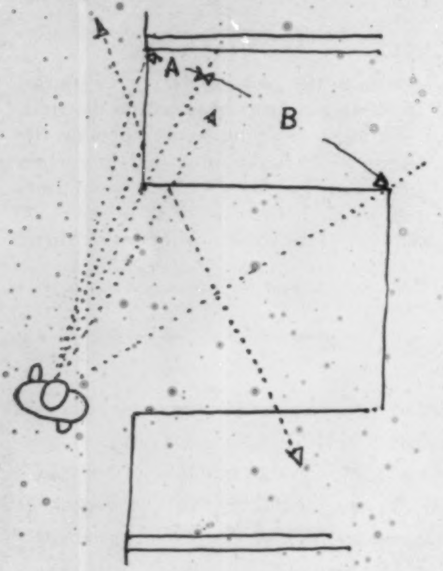
*Vice-President Grand Rapids Store Equipment Company, Grand Rapids, Michigan. Note: This discussion by Mr. Welch appears in the May 1946 issue of Illuminating Engineering, and is presented in the Record in accordance with original plans to acquaint the architect concurrently with this important design problem.

This sketch indicates how external brightness factors on a clear day affect the display window of a neighborhood store on the shaded side of the street with low surrounding buildings. Any display within arcs A and C, reflecting brightness of 1500 footlamberts or more, is obliterated, because one can see only the reflections of skylighted buildings and sunlighted sidewalks. Moving cars and pedestrians add to the reflected confusion. Through small arc B there is fairly good visibility, and through arc D very satisfactory conditions exist. Of course, when the shopper steps close to the window and causes it to reflect the lower brightness of his own figure, the display can be seen to better advantage in that small area




Sun
300
400
A
B
C
To a building across the street in shade 130F.L.
To sunlighted pavement 400F.L

In this example the display is located on the sunny side of the street, necessitating an awning or marquee. This protection against the sun has the effect of decreasing illumination within the window. The display within arcs A and B can be seen fairly well provided the street paving has a dark reflection value and the building opposite is not too light in color, and provided also that the display is lighted, has window backs, and merchandise of sufficient reflection value to create average brightness of 300 to 400 footlamberts. The display within arc C is obliterated by glare from the sunlighted sidewalk



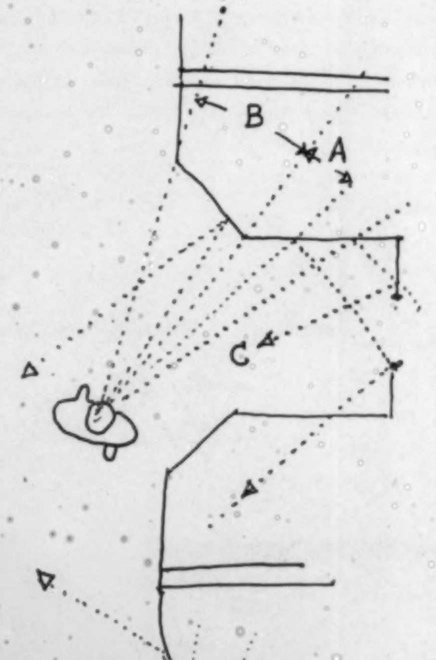
This sketch shows the plan of a typical arcade-type window, indicating how a glass show window set at a right angle to the street reflects the lower brightness within adjoining show windows, when it is approached from the customary oblique angle. The display within arc B can therefore be seen quite satisfactorily. The glass in front of arc A reflects lighted surfaces and possibly even a view of the sky up the street resulting in annoying reflections and veiling glare

this type of display is being reduced materially in linear footage and a view into the store interior and of the interior display of merchandise substituted. This is the so-called "open front" store. Often special trims of merchandise, with low or partial backgrounds, are placed adjacent to the enclosing glass to be inspected primarily from an exterior viewpoint.

The number of stores adaptable to open-front design is much greater today than that of stores requring enclosed show windows, and will increase. There are only about 4000 department stores, most of which sell on multiple levels, requiring preferably "closed-in" displays, in order to present merchandise from upper floors. The 800,000 food, drug, and miscellaneous stores, and 17,000 variety stores, 20,000 shoe stores, and 26,000 women's specialty stores, the great majority of which sell on one level, can or do use the open or partially open front, putting their entire interior on display from the street. There are at least ten stores of this potential "open-front" type to one of the other.

The open-front design has the effect of eliminating the physical barrier between the exterior and interior, and psychologically helping in the expensive process of getting the prospective customer inside the store. Once the merchant gets the customer past this barrier, half his battle is over. With the elimination of veiling glare and all reflections, the enclosing glass does not exist as an architectural surface, even though the glass frame may remain as part of the composition.

This trend toward open-front design, which places the interior on display from the street, emphasizes the importance of producing brightness values on the interior architectural surfaces and merchandise to overcome the veiling glare on the enclosing glass. This problem is much more difficult to solve in the average interior with the open front than in the shallow show-window background which in many cases is lighted largely by daylight. This problem of glare and its analyzation is concerned entirely with brightness factors, and through brightness engineering a solution can be found.



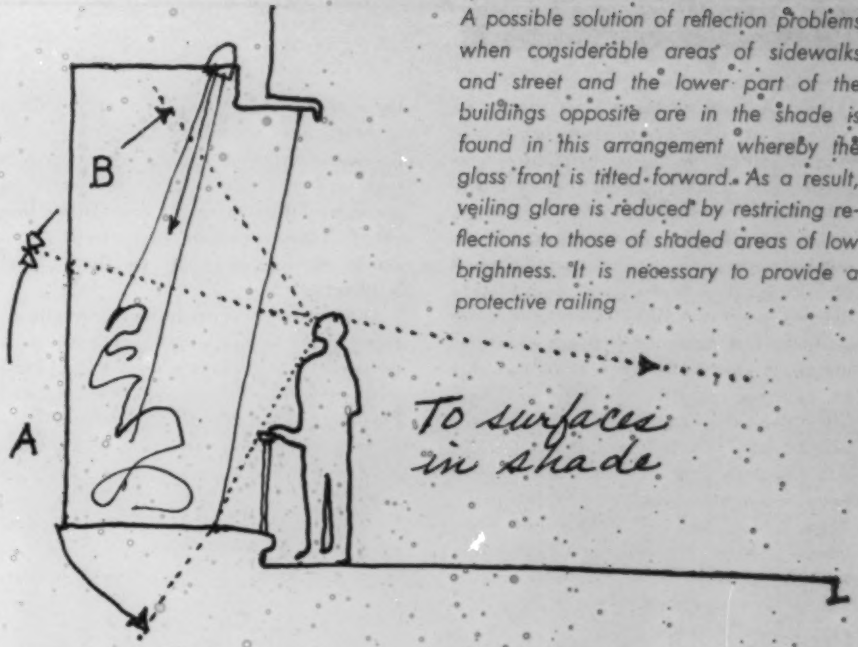
Clipped corners, often used because they appear so inviting from a traffic standpoint in plan view, frequently cause bad veiling glare over a large portion of the window. From the oblique approach, all of the display in arc B can reflect daylighted surfaces. Also to be considered are the double reflections of high brightness value such as might occur in reflection line C. A typical curved window, which again looks interesting in plan, reflects and distorts everything that might be daylighted in the street, reducing in size the reflected objects, but showing a multiplicity of accented brightness patterns that act as an efficient camouflage in concealing merchandise on a bright day

VEILING GLARE

Plate glass, when clean, is a transparent substance with two polished surfaces, which is about eight per cent efficient as a reflector. It is the reflection of light from these two surfaces which reduces the transmission of the light through the glass. There is a process available which introduces on glass surfaces a film a fraction of a wave length of light in thickness, which greatly reduces the reflection and thereby increases materially the transmission of light. To date, however, this process is valuable mainly for lenses and has limitations as to size of glass that can be treated. Also, the microscopic film is not very durable in exposed positions.

It is evident, therefore, that when one attempts to view a surface of given brightness through this transparent reflector, reflecting a greater brightness, it becomes necessary to look through the latter, which appears as a fog or veiling glare when reflecting plain surfaces. This obviously hampers the ability to see surfaces and details on the other side of the glass.

When a pattern of brightness is reflected, as in the case of the highlights from specular metallic sunlighted trim on an automobile, the distractions can be even more harmful in obliterating the display, because the reflected design is something upon which attention can readily be focused. The relative distances involved — first, from the eye through the glass to the display being observed, and, second, the sum of the distance from eye to the glass and back to the bright pattern being reflected — have a decided bearing. When these two distances are widely separated, one can focus on the display with binocular vision, and see better through the reflection which is out of focus. Also in the case of reflecting patterns, if the patterns are in motion, as from pedestrians or vehicles in sunlight, and the viewer is in motion, especially in a swiftly moving automobile, the moving reflection can become increasingly distracting when one is attempting to fixate on the motionless display. In this case the matter of speed of vision and relative brightness* also become a matter of importance.



A possible solution of reflection problems when considerable areas of sidewalks and street and the lower part of the buildings opposite are in the shade is found in this arrangement whereby the glass front is tilted forward. As a result, veiling glare is reduced by restricting reflections to those of shaded areas of low brightness. It is necessary to provide a protective railing

THRESHOLD OF HARMFUL VEILING GLARE

In this analysis only the simpler problem of reflecting fairly large areas having a plain surface is considered, because on many occasions it becomes necessary to place the glass in such a way as to reflect plain surfaces that are a part of our architectural structure.

We can establish by observation, assuming average eyesight, that we reach what we call "apparent veiling glare" when the ratio of the brightness of the plain surface being reflected to that of the surface being viewed through the glass is unity (one to one). This assumes that both surfaces are large enough to be worthy of consideration.

In this case the resulting veiling glare is just barely apparent and is not harmful. It results in what can be called a quite satisfactory condition. Any increase, however, in this ratio will result in an increasingly unsatisfactory condition.

When the ratio of reflected to viewed brightness reaches two, a condition results which can be called the threshold of destructive veiling glare. This condition materially reduces the ability of the displayed area to attract attention.

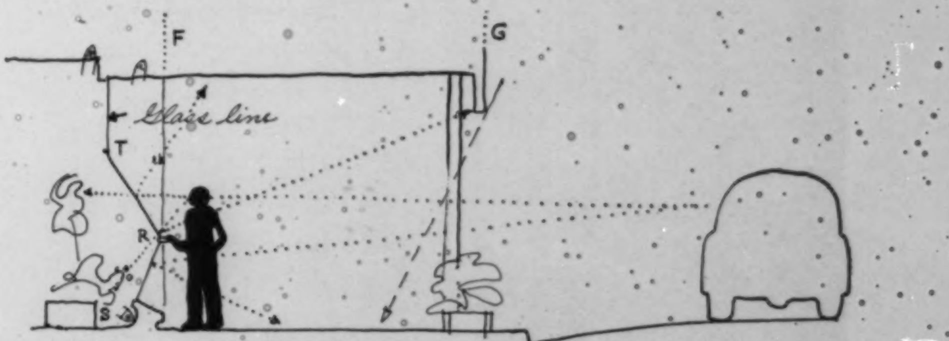
When a ratio of five is reached, there is an impossible condition which completely destroys the primary function of the display. This condition can result when a clear sky or sunlighted surfaces with medium reflection factors are reflected. It is impossible to create brightness with artificial illumination on large enough areas to overcome veiling glare satisfactorily under this condition.

If it is important to see the display, it therefore becomes necessary to arrange the glass geometrically in reference to normal and important viewpoints so that only surfaces of lower brightness are reflected. These surfaces can be those of neighboring structures that are in shade or simple surfaces which are part of your own structure, the brightness of which can be controlled.

INFLUENCE OF THE SITE

It is an accepted principle of good architectural practice to analyze a given site from all possible angles and all exterior conditions that might have a bearing on the design of the structure.

One condition that will not change is its solar orientation. However, we may have a central-district site in one of the man-made canyons, with such an orien-



When a permanent canopy is part of the design, with building line at either F or G, the reflection factor of the sidewalk can be lowered to a practical minimum and ceiling of the canopy reduced to a possible 30 per cent reflection factor. Distracting reflections can be eliminated by setting the glass at a protruding angle and providing normal interior brightness. Transom bar T is at door-head height, and joint R provides a natural protection to the glass tation that all surfaces that might be reflected in display-enclosing glass are comparatively low in brightness regardless of weather conditions. On the other hand, we may have low buildings, vistas the length of a street, light-colored structures in direct sunlight, all of which, if reflected, can completely destroy display values. Too often store buildings are designed without considering these varying brightness factors due to external conditions. The architect often produces (or reproduces) a pretty picture of a window and trusts that it will function properly. A client might even have examined and approved a satisfactory window treatment elsewhere, which, under the different external conditions existing on his own site, would prove unsatisfactory from the standpoint of visibility.

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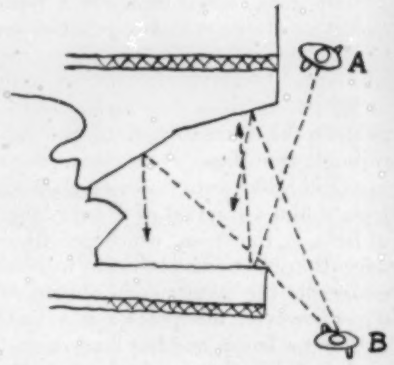
*Note: See "Illumination and Vision" by C. L. Crouch in Illuminating Engineering, Volume XL, No. 9, Page 756.

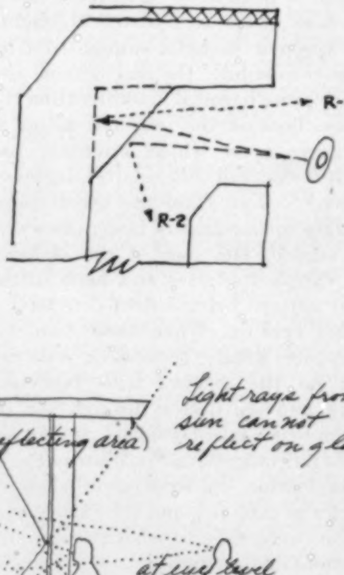
As an indication of these competing brightnesses, consider a display window on the shady side of a street where skylight alone would produce some 400 or 500 foot-candles and some supplementary artificial illumination might raise this to 600 or 800 foot-candles. Assuming a practical average reflection factor of about 50 per cent, on the larger areas of display or surround, we would produce an average brightness of from 300 to 400 foot-lamberts. The ingenuity of the ventilating engineer would be taxed to produce these values of brightness with only artificial lighting. Yet with even these much higher than average values of brightness we cannot permit the reflection of bright sky, light-colored buildings or even light-colored sidewalks in sunlight without causing harmful veiling glare. These exterior brightnesses can reach or exceed 1500 to 2000 foot-lamberts.

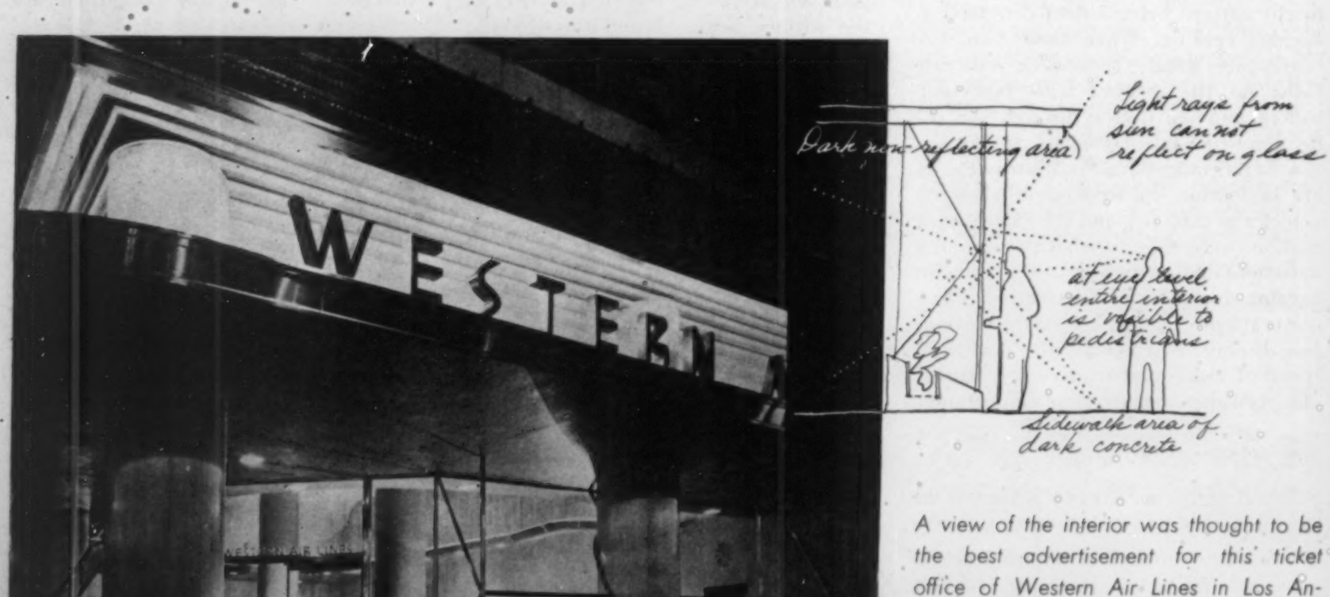
It is obvious that under these conditions, with today's lighting tools it is quite impossible economically to produce with artificial illumination the required brightness on surfaces large enough to attract attention. Therefore, when such external conditions do exist, and we want to realize the full value of an open front in the daytime, we must dispose our glass geometrically so that it reflects areas of greatly reduced brightness that exist in the vicinity or that can be incorporated as part of the structure we are building.

There are many ways that this can be accomplished from both a plan as well as a vertical-section standpoint. The accompanying illustrations are not intended as designs, but merely illustrate the principles outlined. They indicate conditions to avoid, some of the problems, and a few possible solutions. All are based on the law which states that the angle of reflection equals the angle of incidence and the fact that plate glass is about eight per cent efficient as a reflector. The rest is a question of knowing your brightness values. ■



Above: Illustrated again is principle that glass set at right angles to the street, when viewed from position A, reflects windows opposite and not the daylighted street. Unsymmetrical plan gives the pedestrian at B a good view of the display. Below: Glass set at a 45-deg. angle reflects arcade area along line R-2, rather than daylighted street along line R-1, as in square-corner design




WESTERN A
WESTERN AIR LINES
Dark non-reflecting area
Light rays from sun can not reflect on glass
at eye level entire interior is visible to pedestrians
Sidewalk area of dark concrete

A view of the interior was thought to be the best advertisement for this ticket office of Western Air Lines in Los Angeles. H. Roy Kelley, Architect. Glass set at a conventional angle would have resulted in distracting reflections. The solution was a protruding V-shape design, protected against light from above by a non-reflecting canopy and from below by plants and a black concrete sidewalk

WARTIME ADVANCES IN WELDING

During the war years the welder became, with reason, the personification of the battle of production on the home front. Consequently the great emergency gave welding a vastly extended field of application in which wide experience was gained, so that today the welding of steel skeletons of buildings offers the architect a more readily available and technically matured construction method.

Out of the war effort came the following advances:

1. The many welders trained during the war in shipbuilding and aircraft manufacture form a great pool of potential structural steel framers.
2. Fabrication plants with a wealth of experience in the production of welded members now have an excess capacity available for producing structural steel.
3. Improved methods of design and standardized details have been developed to produce stronger, simpler structures more quickly and at lower cost.
4. Welding equipment and electrodes have been developed to produce stronger welds with greater speed in any position.
5. Improved methods of inspection have been developed to insure compliance of workmanship with codes and specifications.
6. Revised building codes often provide for the use of welding where not formerly permitted.

THESE ARE THE BASIC ADVANTAGES OF WELDING:

For the architect, the freedom possible in the handling of the architectural scheme and layout of the structure is a feature of some interest. Variations may be introduced to conform with the functional requirements of the individual problem. Truss-framing of irregular panel lengths can be fabricated easily, with truss members at various angles to allow clearance for openings as dictated by architectural considerations. Rigid frame construction permits the use of a bent-rib roof member, giving unobstructed floor areas, maximum headroom, freedom from diagonal cross-bracing and from shadow lines from truss members. This makes for the best lighting and visibility in such buildings as auditoriums, gymnasiums, armories, hangars and many industrial buildings. Furthermore, when price differentials exist, or it is anticipated that there will be difficulty in obtaining a specific material, plates may be substituted for rolled shapes in the fabrication of individual members.

Fast erection in the field. The use of welding permits more prefabrication away from the building site, and in positions where connections are more conveniently made. In addition to being made of a smaller number of components, the welded member requires no punching or drilling of rivet holes, which results in less handling during fabrication, simpler shop procedure, and more rapid erection. Angles for temporary field connections may be punched and welded to the main members in the shop to speed assembly on the job. The assembly of components may be fabricated to accommodate the easiest position for welding on the job.

Economies. The welded connection is the simplest structural connection, for the two members are joined directly to each other without a third connecting member. Since welding simplifies not only the individual structural forms, but also multiple assemblies, and facilitates both shop fabrication and field erection, a saving in the cost of material and labor is effected. Further economies in space, weight, and cost result from the following: (1) the elimination of holes required when riveted connections are to be made, thus affording effective use of the full cross section of members; (2) the use of single plates instead of angles in making built-up members, and for stiffeners in plate girders; (3) the possibility of using lighter structural members with rigid end connections; (4) the considerable saving in metal used in the joints; (5) the generally more effective distribution of material.

Simplified maintenance. The smooth surfaces of welded fabricated members are easily cleaned and painted, and there is small area to be covered. Simplified forms of details and connections present minimum opportunity for corrosion.

Ease of remodeling. Remodeling and making additions may be accomplished with a minimum removal of existing walls, floors, etc., because the exposure of beam ends or column faces to which welds are to be made is sufficient to accomplish the connection. There is no need for the exposure, preparation, and punching of larger areas. Since the necessity of field drilling or punching is eliminated, large savings of time and labor are effected. This results in reduced disruption of normal activities in the building being altered.

Elimination of noise nuisance. In considering the advantages of welded construction as compared with riveted structures, an advantage obvious to the layman is the elimination of noise. When buildings are constructed near hospitals, schools or libraries, ordinances frequently require that welded construction be used.

THE WAR BROUGHT MANY ADVANCES:

The exigencies of war production overcame many obstacles that previously had retarded a more general adoption of welding. These were: (1) skepticism about the value of the welding processes through inexperience; (2) lack of trained personnel; (3) preference on the part of the steel fabricators, with few facilities for turning out welded shapes, to continue production of riveted members for which their plants were primarily designed.

With our entry into the war, the major part of all steel production was suddenly diverted to shipbuilding and aircraft construction, in which the accepted practice for joining structural steel parts was by welded connections. Many steel fabricating plants were converted from the use of riveting to the use of welding. Steel fabricators made drastic changes in their organizations and plants. New equipment was installed, and new procedures established. Workers were trained and valuable experience was gained in the design and assembly of welded frames for structures. Through the production of enormous quantities of structural welded work, it was established that welding may be used with the assurance that safe and useful structures will result.

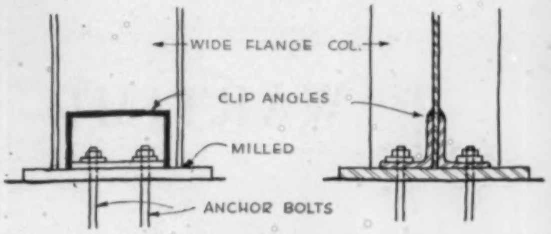


Fig. 1: In this typical design for a welded column base, the column is welded to clip angles which are bolted to the base plate

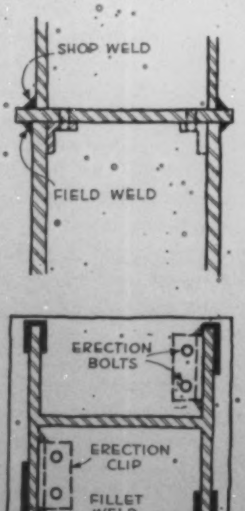


Fig. 2: All column splices in the construction of Benjamin Franklin High School, New York, were welded in this manner

Steel fabricating plants fully versed in the production of welded structural members now have an excess capacity. Furthermore, contrary to the condition that exists in the majority of the building trades, there is an abundance of technicians trained in the use of welding for structural assembly. With the products of much research and highly technical development, a wealth of shop practice and experience, and an abundant supply of operators trained in assembly procedures, welded steel processes are in a strong position to help in meeting the demands for new construction in all classifications of building.

IMPROVED DESIGN AND TECHNIQUE

Broad and continuous research, particularly during the war years, has developed a more efficient and rational method of design. With increased knowledge and experience, the early tendency to copy designs developed in riveted structures has been supplanted by better methods applicable specifically to the welded technique. Standardized details and design diagrams have relieved the designer of many of the routine calculations that were once necessary. In recognition of the progress made in the development of the science and technique of welding, the American Institute of Steel Construction has for the first time, in its 1946 specifications for standard procedures in steel construction, included welding in a single specification with riveting and bolting. Previously welding was regarded as an entirely separate subject, and had been covered by an individual set of specifications.

Whereas before the war it was commonly thought that welding held its greatest advantage in work that did not involve enough duplication to warrant making elaborate templates, it has been found that welding has particular advantages in duplication. Much study has gone into the best methods of preparing jigs for the assembly of parts in the shop.

Advance has been made in the use of "slot" and "plug" welds to increase areas of welded surface, and to assure proper and convenient position for the operator. Study of stress flow lines and the importance of maintaining paths as nearly uniform as possible has resulted in improved standards for the formation of welded joints. The use of cut-out sections to avoid intersecting welds from several directions, and the avoidance of welds transverse to the lines of stress in tension members have been accepted as standards. "Butt" welds have come into increasing favor, due to the more general recognition of their greater freedom from stress concentrations and consequent greater strength in fatigue caused by vibration, repeated or cyclic stresses or dynamic shocks, which have at times in the past caused failure of connections.

Study has been given to the utilization of the inherent rigidity of welded connections to obtain an economy of material in designs embodying the principles of continuity and rigid frame construction. By the introduction of a semi-rigid type connection for partially restrained framing, mid-span moments of beams have been decreased and end moments increased to a point where they approach equality, thus providing a better balanced design with lighter beam sections. The warping and bending effects occasioned by the high heat of welding are understood better today, and precautions are taken to counteract them.

BETTER EQUIPMENT AND ELECTRODES

Manufacturers have maintained a constant progress in the development of welding equipment, and in the introduction of electrodes to meet the diverse needs encountered. Better electrodes have been developed for use in a.c. welding to produce a weld metal of a quality as high in any position as had previously been attainable only in the flat position. The superior quality of welds made with coated electrodes has been acknowledged by the American Institute of Steel Construction, whose specifications for 1946 allow for the use of stresses in the weld metal equal to those permitted in the base metal.

HIGHER INSPECTION STANDARDS

To visual and mechanical inspection methods formerly used there have been added electromagnetic and radiographic tests. Practically all building codes that accept welded assembly of steel structures require that all operations be inspected and approved by a qualified inspector. The inspector's responsibilities cover work prior to, during and after the actual welding. In addition to determining that materials are of proper composition, homogeneous and free from defects, the fitting of the various members and the preparation of edges and surfaces to be welded must be checked for compliance with fixed standards. During welding, the temperatures, quality of welds, welding procedures must all have the approval of the inspector. After welding, bonds are checked to assure proper penetration of weld metal, freedom from porosity, correct profile with no undercutting, absence of cracks or checks in weld and surrounding metal, and proper alignment without warping. The completion of these inspections assures that the sound and substantial framework envisioned in the design has been realized in fabrication and erection.

LIBERALIZED BUILDING CODES

Although building codes were slow to provide for joining of structural steel by welding, and for a while hampered an extended use of the process, by July, 1943, over 140 cities permitted structural steel welding. Subsequent to that time many other cities altered their building codes to permit the use of welded connections. It was the adoption of a new code in New York City in 1937, which included acceptance of welding in steel fabrication and erection, that gave a decided impetus to its being accepted by a great number of smaller cities. Building code requirements are constantly being simplified and standardized, while additional cities continue to adopt the welding technique as a recognized procedure.

FUNDAMENTALS OF WELDED DESIGN

Certain basic principles established by welding engineers prove useful in an understanding of the design problems involved in planning a welded structure:

1. Design especially for welding, dismissing riveted prototypes from mind.

2. Remember that simplicity of detail is the keynote of welded design. A simple design is the best technically, and the most economical.

3. Do not reduce weight of material, however, below point where increased fabrication cost more than offsets saving in material.

4. Visualize a planned sequence of construction operations which will permit control of distortion and shrinkage stresses.

5. Avoid eccentricities in connections where possible, and take into consideration any appreciable ones, even though they may be neglected customarily in standard riveted connections.

6. Avoid "notch effects" that induce concentrations of stress, and abrupt changes in contour or section that would interfere with smooth paths of stress flow.

7. Make the surfaces of butt welds sufficient only to insure full cross section equal to that of base metal. Avoid so-called "reinforcement" of butt welds.

8. For fillet-welded connections, combine transverse welds with longitudinal welds for smoothest flow of stress lines and best stress distribution.

9. "Box" or return fillet welds by extending them full-size around adjacent corners, especially where a longitudinal fillet theoretically ends at a corner not adjacent to a transverse weld.

10. Avoid tendencies toward progressive bending or rotation (not inherently self-limiting) about longitudinal axis of a fillet weld in a direction causing tension in the root.

11. Avoid details that might cause progressive tearing of fillet welds from one end to another, similar to the "unbuttoning" of a line of rivets due to bending.

12. Utilize wherever possible the natural adaptability of welding to continuous and rigid frame types in which rigid joints are required.

13. In the case of simply supported beams or girders (tier buildings without wind bracing), provide for sufficient flexibility of connections, such as is afforded by standard riveted connections, to permit end rotation of beams that must accompany simple beam deflection. Proportion welds to sufficient strength to insure deformation in the base metal.

14. In welded splices and connections, investigate stresses in both welds and base metal to determine critical section, as in riveted work.

15. Exercise care in using welds in combination with rivets and bolts (computed to carry stress) in the same structure. If grouped together, the rivets cannot slip to develop bearing and assume their share of load.

16. Bolted field connections for lightweight secondary beams, when permitted by the code, work out satisfactorily in conjunction with welding for other field connections and shop work. Often some costs can be saved by shop welding even though field connections are riveted. But field welding adopted to eliminate noise is invariably uneconomical when welding is not adopted for shop work also.

17. Detail connections and joints to provide a maximum of shop welding and minimum of field welding. Also design for welding in downhand position wherever possible.

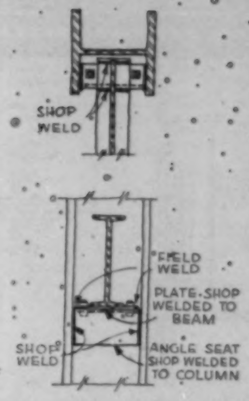


Fig. 3: No additional stiffener is required in this type of indirect seat-angle connection of beam to column flanges

18. Where holes are necessary for rapid construction, as for tier buildings, detail shop and field work for the least punching and drilling in as few parts and as few heavy members as possible. For best economy, avoid punching and welding on the same member wherever you can.

19. Some temporary connections can be made from clips, cleats, etc., and held until welded, but positive means must be provided to hold members together and align them prior to welding.

20. Provide duplication in parts of sufficient similarity for the use of jigs and fixtures wherever practicable.

21. Specify steels of known weldability characteristics. For special steels, specify electrodes, welding rods, and procedures that are known to be suitable.

22. Provide definite information by means of adequate symbols such as Standard A.W.S. Symbols (and notes where necessary), referring to standards or special types of welds, and to workmanship specifications for making them.

DESIGN OF FIELD-WELDED CONNECTIONS

The various types of members and their assembly in the structural skeleton of a building have individual characteristics and requirements that must be thoroughly understood before a techni-

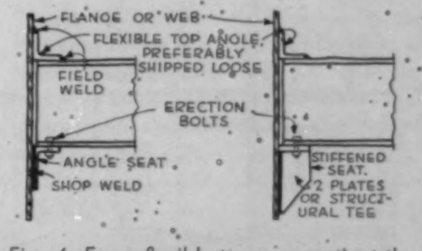

FLANGE OR WEB
FLEXIBLE TOP ANGLE, PREFERABLY SHIPPED LOOSE
FIELD WELD
ERECTION BOLTS
ANGLE SEAT
SHOP WELD
STIFFENED SEAT. 2 PLATES OR STRUCTURAL TEE

Fig. 4: For a flexible-type connection, the beam may rest on a welded angle-seat, with the addition of a welded top angle

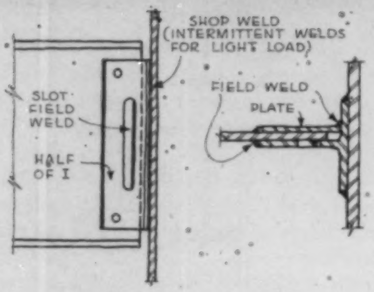

SHOP WELD
(INTERMITTENT WELDS FOR LIGHT LOAD)
SLOT FIELD WELD
HALF OF I
FIELD WELD
PLATE

Fig. 5: In this type of beam-to-column connection, the web of the beam is welded to half of an I-section, previously welded to the column flange. A slot in the I-beam provides easier access for welding

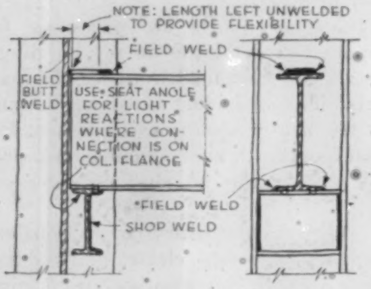

NOTE: LENGTH LEFT UNWELDED TO PROVIDE FLEXIBILITY
FIELD WELD
FIELD BUTT WELD
USE SEAT ANGLE FOR LIGHT REACTIONS WHERE CONNECTION IS ON COL. FLANGE
FIELD WELD
SHOP WELD

Fig. 6: A semi-flexible wind-bracing connection may be provided by supporting a beam on an I-section, which has been welded to the column flanges, and by adding a connection plate welded to top flange of beam and to column web

cally satisfactory arrangement can be achieved. While these may be more or less complicated and exacting, the general principles which have been outlined in the foregoing paragraphs must in all cases govern. Below are considered some individual connections that are used frequently in welded structures.

COLUMN BASES

The simplest form of connection is that of the column to its base. When columns are not subjected to tension or bending moments, which their bases must be designed to resist, the design will be determined by simple gravity loads. Such columns may be either shop welded to the base plates or field welded. In either case the base plate is anchor bolted to the base. When the masonry plates are large, it is usually desirable to set and level them separately before beginning column erection, the milled column bases then being attached equally to the anchor bolts and masonry by means of clip angles welded either to the web or flanges of the column.

Eccentric applications of gravity loads, or horizontal forces such as wind, traction and sway or temperature, however, cause bending stresses. In structures having considerable extent it may be found that temperature changes will impose bending stresses on the outside columns, whereas under ordinary circumstances they would support only a simple gravity load. Rigid frame construction also introduces these forces. In designing bases to meet these conditions, clips, angles or channels are bolted to the masonry and welded to the columns, in order to give a stiffened connection capable of resisting the bending stresses. Fig. 1 illustrates this method of column setting.

COLUMN SPLICES AND CONNECTIONS

The simplest column splice, made without punching of the columns, employs clip angles shop welded to each flange of the column. These are field bolted during erection until a butt weld can be made. Another method of splicing is by welding small punched plates to the ends of the column sections, which, in the field, are bolted together prior to welding. In a third method, which is indicated in Fig. 2, punched angles are shop welded to the top of the lower section of the column, and a punched plate is welded to the bottom of the upper section to be joined to it. Temporary connection is made in the field with bolts until a field weld can be made to join permanently the plate and the lower section of the column.

FLEXIBLE CONNECTIONS

The most direct way of framing a beam to a column is to land the beam on a seat attached to the column, and to secure the beam to that seat. This is the method employed for securing beams subjected to uniformly distributed or concentrated static loads, in order to accommodate the deflection which will result under load.

The use of an angle seat shop welded between the flanges of a column is illustrated in Fig. 3. To this angle the beam, which has a punched connection plate welded in the shop, is bolted during erection, and later welded. The vertical leg of the angle acts as stiffener. A flexible connection at the top prevents sideward twisting of the beam without imposing any end restraint. No transfer of horizontal stresses can take place, for the heel of this angle connection being left free, deflection of the beam under load will result in deformation of the angle, and therefore the beams exert only a vertical load stress on the supporting column.

The attachment of a beam to the flange of a column is demonstrated in Fig. 4. In this case the beam rests on an angle seat welded to the side of the flange. If heavily loaded, the angle may be stiffened by a plate set vertically within its two faces. A flexible connection is provided for the top flange of the beam, by welding an angle to both column and beam in a manner similar to that in the illustrated example.

Another method of accomplishing

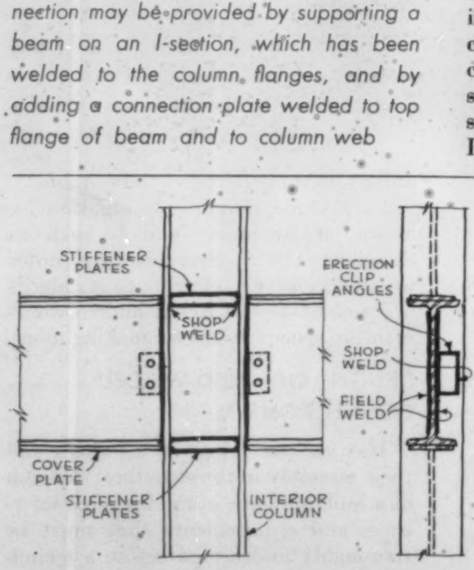

STIFFENER PLATES
SHOP WELD
COVER PLATE
STIFFENER PLATES
INTERIOR COLUMN
ERECTION CLIP ANGLES
SHOP WELD
FIELD WELD

Fig. 7: In this design for rigid construction with continuous columns, the beams are welded to the flanges of the columns. In order to carry stresses across the column sections, stiffeners are shop welded between the column flanges

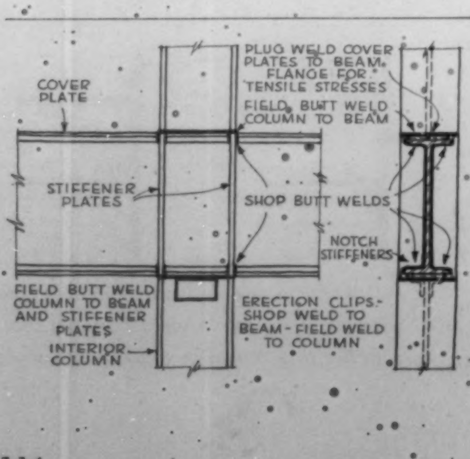

COVER PLATE
STIFFENER PLATES
FIELD BUTT WELD COLUMN TO BEAM AND STIFFENER PLATES
INTERIOR COLUMN
PLUG WELD COVER PLATES TO BEAM FLANGE FOR TENSILE STRESSES
FIELD BUTT WELD COLUMN TO BEAM
SHOP BUTT WELDS
NOTCH STIFFENERS
ERECTION CLIPS-SHOP WELD TO BEAM-FIELD WELD TO COLUMN

Fig. 8: Rigid construction with continuous beams is afforded by butt welding columns to the top and bottom of the beam. Stiffeners equivalent to column flanges in section are butt welded between the beam flanges while in the shop

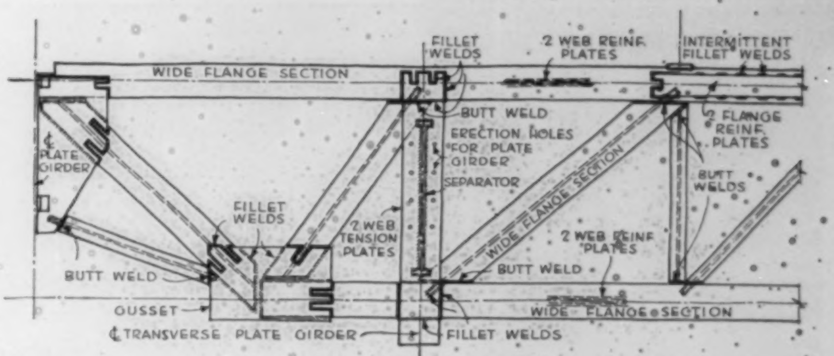


Fig. 9: Welding permits fewer gussets in this type of heavy truss. At one end, welded gussets are used to develop sufficient connection area, but are smaller than usual

beam to column connection is that shown in Fig. 5. Here the web of the beam is welded to half of an I-section which has previously been welded to the column flange. For heavier reactions an additional plate is welded to the side of the beam web opposite the I-section leg. As the beam flanges, in which the greater part of the stresses are concentrated, are left free, tension stresses carried in the web are absorbed by deformation of the connecting metal, and no horizontal stress carries into the column.

SEMI-FLEXIBLE CONNECTIONS

Where it is desired to have a certain amount of restraint on the beams and columns, in order to provide for wind bracing or other purposes, the type of connection illustrated in Fig. 6 may be used. Here the beam is supported by an angle or I-section, the top flange of the beam being welded to the front edge of a plate which is welded at the back to the column web. The inherent elasticity of the material in the plate thus gives limited flexibility to the connection.

RIGID CONNECTIONS

Beam and column connections made by other methods are usually quite flexible. However, welding offers the possibility of a completely rigid structure, for welded joints are as rigid as the metal itself. Therefore, by the use of welding, continuity and economy in the main material unattainable by any other method may be achieved.

In order to take advantage of the benefits to be derived from continuity, a considerable revision is required in the design of beams and columns. For fully fixed end beams there is a theoretical saving of from one third to one half, and when auxiliary cover plates and variable depth sections are employed to reinforce the short length of span in which the higher values of negative moment exist, additional advantages will be gained.

FIXED END AND CONTINUOUS BEAMS

Continuous columns may be used if the beams are field butt-welded to the flanges of the columns as shown in Fig. 7, and stiffeners shop welded between the column flanges. The stiffeners carry stresses across the column sections. At times a variation of this method is employed, in which short beam sections are shop welded to the columns, and the beams are field spliced at the inflection points in the span. This is the usual method when the cross sectional area of the column is large as compared to the area of the beam.

The second manner of effecting beam to column joints in a rigid assembly is to use continuous beams with the column butt welded to the top and bottom of the beams as indicated in Fig. 8. Stiffeners equivalent to the column flanges in section are butt welded between the beam flanges in the shop. The beams are continuous over the lower sections of the column, and have only one field splice per span located in the beams at one of the inflection points. The upper column section is butt welded to its seat on the beam. In the latter method of erection, the connections to the interior columns of the structure receive but a very small portion of the moment in the beams as compared with that transferred through the connections from beam to column in the former method. Erection problems are also simplified, for shop welded connection angles slip over the top of the column and engage a bolt through the web. Thus the beam is immediately supported by the column. A similar bolted connection connects the webs of the beams at the field splice.

BEAM CONNECTIONS

The connections of beams to beams or of beams to girders are simply accomplished by butt welding. The shop punching of the main members to provide for temporary field connections should be eliminated as much as possible, in order to reduce fabricating costs. Angles punched and welded to the members provide a simple and economical field connection.

PLATE GIRDERS

Since the plate girder is composed of a great many pieces and requires extensive shop fabrication it offers one of the outstanding examples of the efficiency of welded design. The elimination of rivet holes makes the full depth of the web effective, and therefore the depth may be decreased as compared with the depth of the riveted girder. Lighter plates are used instead of angle stiffeners, fillers are eliminated, and the weight of weld metal is considerably less than that of rivets. There are half as many pieces to handle in fabricating, thus effecting a decided saving in labor.

TRUSSES

In trusses of proper arc-welded design, gusset plates are generally eliminated. Tension members in the arc-welded design are lighter than those in riveted design because the cross section does not have to be increased to account for rivet holes. They may be designed in various ways using T-shapes, H-shapes or U-shapes for chords. The web members are generally angles or channels. At any given joint, the component of stress of a web member which is picked up by the next web member is transferred directly from the one to the other without passing through the chord at all. In a riveted truss all web members must be connected to the gusset plates for the full stress they carry, and the component is picked up by the next web member through the gusset. The inherent rigidity of welded construction offers resistance to lateral forces such as those generated by the operation of mechanical equipment and to wind stresses. Trusses are not necessarily limited to roof construction, and will frequently offer opportunities for considerable economies in space and weight when used instead of beams or girders to support floors carrying heavy loads. Furthermore, their use will decrease deflection. The detail in Fig. 9 indicates how most joints of heavy trusses can be made without gusset plates by means of welding.

RIGID FRAME CONSTRUCTION

The opportunities in architectural design offered by the use of rigid frame construction have already been mentioned. The clean lines and the arched forms that are obtainable are highly effective. In the forming of the shaped beams that compose the framework, the greater part of the work can be done in the fabricator's shop. This results in the erection becoming a simple beam and column job, and assures maximum speed and economy.

Figs. 1, 3, 7, 8, and the photograph; courtesy of The Lincoln Electric Company.

Figs. 2 and 4: courtesy of Engineering News-Record, and Air Reduction Sales Company.

Figs. 5, 6, and 9: courtesy of Air Reduction.

MANUFACTURERS' LITERATURE

AIR CONDITIONING

Carrier Air Conditioning — Refrigeration — Unit Heating. Booklet discusses air conditioning, refrigeration and heating engineering services offered. Various types of dehumidifiers, air conditioners, compressors, condensing units, cold diffusers, unit heaters and heat diffusing units are shown and described. 12 pp., illus. Carrier Corp., 300 South Geddes St., Syracuse 1, N. Y.*

AIRPORT HANGARS

Airports by Luria. Complete airport design and construction service is offered in this folder. Details and dimensions of standardized hangars constructed on a unit system in a variety of designs. Flexible arrangement of units and possibility of expansion are emphasized. Hangars for commercial airports and for small planes. 8 pp., illus. Luria Engineering Corp., 500 Fifth Ave., New York 18, N. Y.

DRAFTING

Axonometric Drawing . . . the Universal Picture Language. Principles of isometric and dimetric projection for pictorial engineering drafting are discussed, together with the requirements for producing true, accurate drawings of these types. Methods of using the "Instrumaster" stencils to replace scales, triangles and protractors for speedier axonometric drawing. 20 pp., illus. John R. Cassell Co., Inc., 110 West 42nd St., New York 18, N. Y.

ELECTRICAL APPLIANCES

General Electric Major Appliances. File of specification sheets covers refrigerators, ranges, dishwashers, water heaters, clothes dryers, "Disposall" units. Construction features and details, capacities, dimensions, specifications. Installation details and location of utilities. 46 pp., illus. General Electric Co., Appliance & Merchandise Dept., 1285 Boston Ave., Bridgeport 2, Conn.*

FANS AND VENTILATORS

Airjet Roof Ventilators and Vent Flue Caps. Aerodynamic principles are discussed in relation to design of roof ventilators and vent flue caps. Engineering data given for calculation of wind pressure, heat transmission and heat loss through roofs, attic temperatures, solar heat transmission through skylights, size of ventilators required. Number of air changes required tabulated by building types. Weather data for major cities throughout U. S. cover maximum and minimum temperatures, average summer temperature, humidity, wind velocity and prevailing wind direction. Discussion of special features, dimensions, specifications, assembling and installation. 16 pp., illus. C. R. Gelert Co., 35 North Raymond Ave., Pasadena 1, Calif.

Emerson-Electric Fans for 1946. Catalog of range of fans from small portable to heavy-duty wall-, ceiling- or column-mounted oscillating fans. Also includes kitchen ventilators, exhaust fans and cooler fans. Complete construction details, dimensions, specifications, weights, current consumption, capacities. 26 pp., illus. The Emerson Electric Mfg. Co., St. Louis, Mo.*

FENCING

Wickwire Spencer Chain Link Fence for Permanent Property Protection. Selection of proper type of chain link fence for various purposes. Erection details for fences using H-post and pipe post construction. Standard gates and details of components. Design of tennis court enclosures, baseball backstops and road guards. Specifications. 24 pp., illus. Wickwire Spencer Steel, Dept. A, 500 Fifth Ave., New York 18, N. Y.*

FINISHES

Moleta Architectural Color Guide. A range of 150 colors, shading from pastels to deep tones, is reproduced in this book designed to be used as a guide in matching wall colors with color samples. For each color sheet, formula is given to show how the shade can be quickly mixed, using the "Moleta" toners and "Moleta" Flat White. 150 pp., illus. Monroe, Lederer & Taussig, Inc., 606 North American St., Philadelphia 23, Pa. $5.

GREASE TRAPS

Handbook on the Proper Sizing and Selection of Grease Interceptors. The purpose, operation and advantages of a grease interceptor are reviewed. Methods of selection. Features of "Greaseptor" and slide rule for selection of proper size. Dimension and capacity tables. Standard installation layouts. 8 pp., illus. J. A. Zurn Mfg. Co., Erie, Pa.*

HARDWARE

Schlage Luster Sealed Aluminum Locks. Folder discusses features and construction of new aluminum locks. Sectional drawing shows individual details and illustrates method of installation. 6 pp., illus. Schlage Lock Co., San Francisco, Calif.

HEATING AND HOT WATER

How to Cut your Fuel Bill. Bulletin presents diagrams showing how to prevent combustion fuel losses. Types of electric draft controls illustrated. Data on operation of controls with stokers, oil and gas burners. 16 pp., illus. Campbell Engineering Co., Appleton, Wis.

Electric Radiant Heating with Roberson Heatsum Cable. General features of radiant heating, and specific characteristics of electric radiant heating. Method of calculating load requirement, thermostat location, specifications and installation. Sizes and properties of the heating cable. 4 pp., illus. L. N. Roberson Co., 1539 East 103rd St., Seattle 55, Wash.

Marsh Hot Water Heating Specialties. Catalog of a new line of circulating pumps, flow control valves, indirect and tankless heaters, expansion tanks, relief valves, gauges and sump pumps. Description of features, materials, construction and operation. Tables of dimensions and capacities. Installation layouts. 8 pp., illus. Marsh Heating Equipment Co., 2120 Southport Ave., Chicago 14, Ill.

I-B-R Installation Guide No. 3. — Indirect Water Heaters. Handbook for selection and installation of heaters submerged in water for use in small homes. Capacity requirements, specifications, installation diagrams and details for various types of boilers. Suggested control arrangements for hot water and steam systems with the usual methods of firing. The Institute of Boiler and Radiator Manufacturers, 60 East 42nd St., New York 17, N. Y. 25 cents.

INSULATION

Ferro-Therm Metal Insulation for Homes. Properties and advantages of sheet steel insulation are analyzed. Installation methods and typical details. Efficiency ratings. Specifications. Special consideration of use of this type of insulation for refrigeration. 12 pp., illus. American Flange & Manufacturing Co., Inc., 30 Rockefeller Plaza, New York.*

Factors Affecting Heat Transmission through Insulated Walls. Test results are given for a variety of insulating materials in varying forms, thicknesses and positions. Tables show range of thermal conductivity, summary of findings and conclusions. 25 pp., illus. Engineering Experiment Station, University of Minnesota, Minneapolis 14, Minn. 40 cents.

LIGHTING

The Story of Edwd. F. Caldwell & Co., Inc. Anniversary brochure outlines the development of artificial il-

(continued on page 146)

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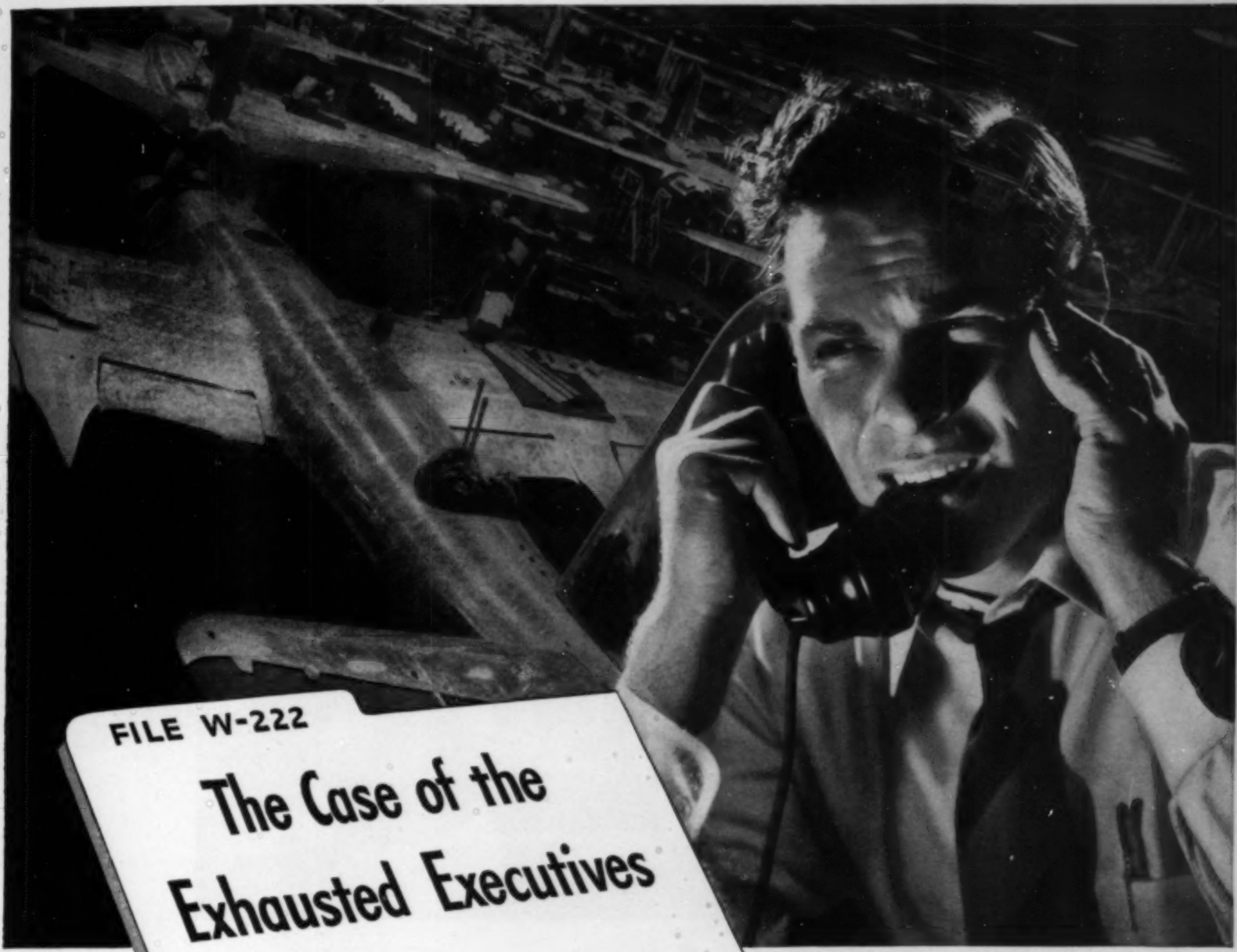
*Other product information in Sweet's File, 1946.



FILE W-222

The Case of the Exhausted Executives

. . . It Happened in Baltimore!

PROBLEM: Nerve-wracking noise—in the Baltimore plant of the Glenn L. Martin Co. Production executives—supervising the Mars, the B-26 Marauders, and the PBM Mariners—had offices alongside the production line. The din was constant, exhausting. Executives had to shout to make themselves heard. It was almost impossible to talk on the 'phone.

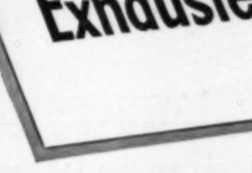
SOLUTION: Management called in the local Acousti-Celotex distributor—member of the only sound-conditioning organization in the world with the "know-how" of over 100,000 acoustical installations. To the ceilings he applied Acousti-Celotex, the original and genuine Ferox processed, drilled fibre tile, and most widely used of all acoustical materials.

RESULT: A distinct decrease in noise—a remarkable improvement in working conditions. All production executives got more done in shorter time with less strain. The benefits of sound conditioning this area were so demonstrable that the Glenn L. Martin Company now has Acousti-Celotex in all offices . . . in cafeterias, reception and recreation areas, as well.

MORAL: It's a smart management that invests in Acousti-Celotex* sound conditioning. Installations in offices, factories, schools, hospitals, stores, banks, restaurants, theaters and churches *prove* this. So consult *your* local Acousti-Celotex distributor. His advice is yours without obligation, and he guarantees results. A letter to us will bring him to your desk.

* * *

FREE! *"25 Answers to Questions on Sound Conditioning."* Timely, interesting, helpful booklet. Write: *The Celotex Corporation, Dept. AR-746, Chicago 3, Illinois,* for *your* copy.



Sound Conditioning with

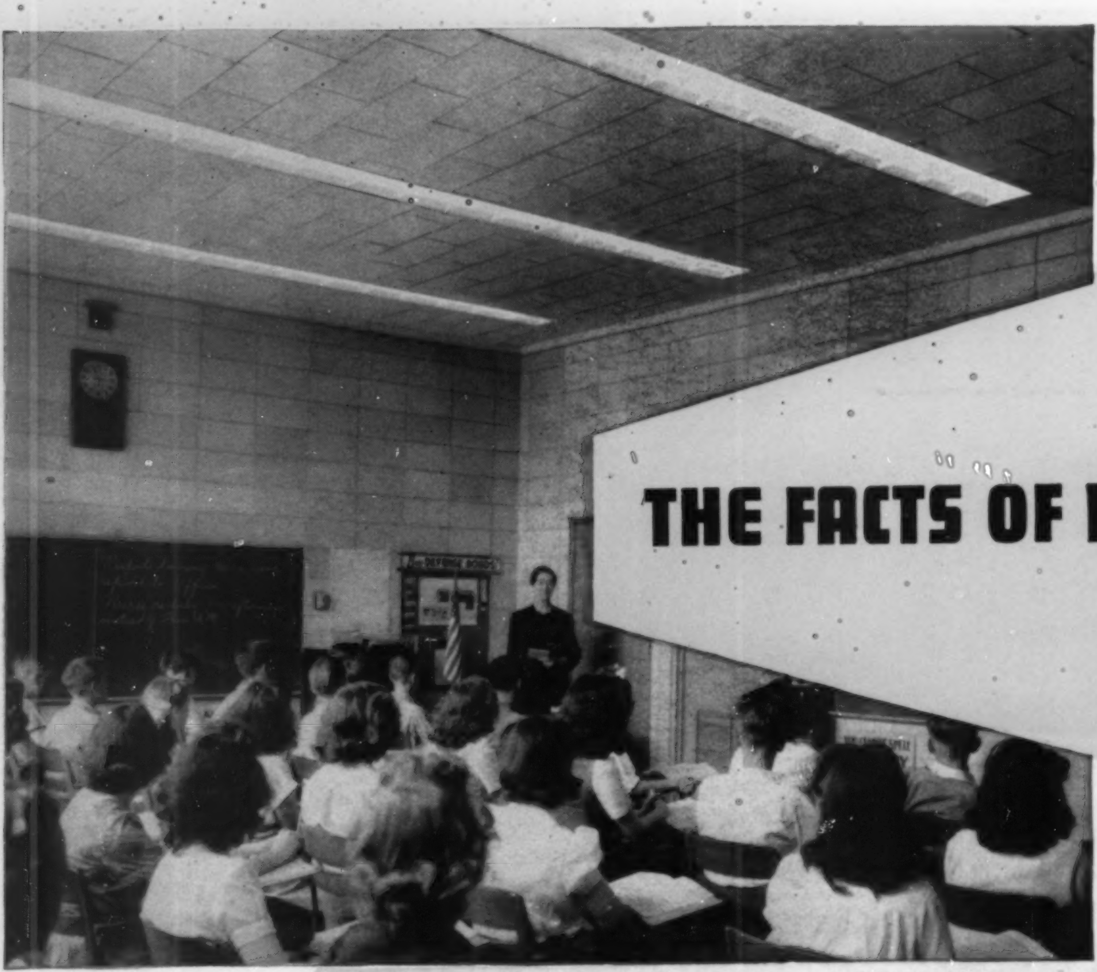
ACOUSTI-CELOTEX

REG. U.S. PAT. OFF.

**Perforated Fibre Tile* SINCE 1923

Sold by Acousti-Celotex Distributors Everywhere • In Canada: Dominion Sound Equipments, Ltd.

A PRODUCT OF THE CELOTEX CORPORATION, CHICAGO 3, ILLINOIS



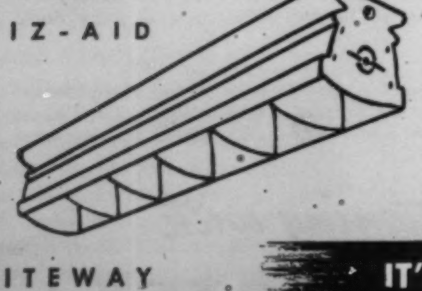
THE FACTS OF LIGHT

Alton, Illinois, High School—a model of engineered lighting achieved with Day-Brite recessed troffers.

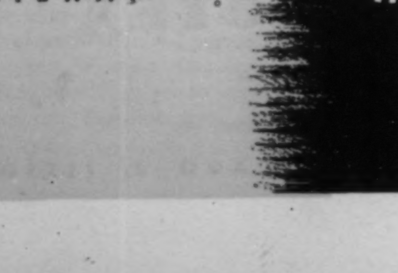
No matter how carefully you engineer your lighting layouts, their success depends largely on the fixtures you specify. Certified distribution curves prove the efficiency of optically engineered Day-Brite fluorescent fixtures. They are skillfully designed for easy installation and maintenance. Quality construction in every detail makes them a dependable source of abundant, glareless illumination.

There is a Day-Brite fixture to meet every lighting need. Write us your requirements,

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.
***In Canada:* address inquiries to Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.**



VIZ-AID



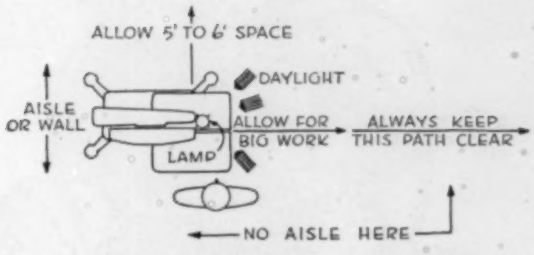
LITEWAY

1051 A

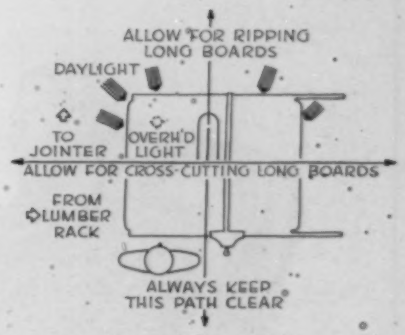
IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

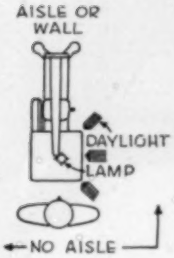
SCHOOL SHOP EQUIPMENT: WOODWORKING


ALLOW 5' TO 6' SPACE
AISLE OR WALL
DAYLIGHT
ALLOW FOR BIG WORK
ALWAYS KEEP THIS PATH CLEAR
LAMP
NO AISLE HERE

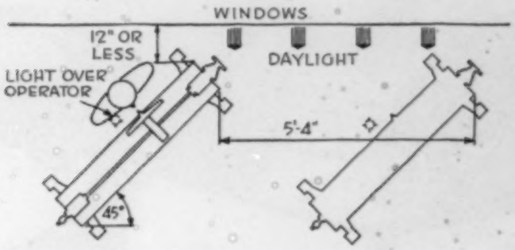
BAND SAW


ALLOW FOR RIPPING LONG BOARDS
DAYLIGHT
TO JOINTER
OVERH'D LIGHT
ALLOW FOR CROSS-CUTTING LONG BOARDS
FROM LUMBER RACK
ALWAYS KEEP THIS PATH CLEAR

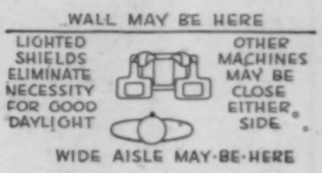
CIRCULAR SAW


AISLE OR WALL
DAYLIGHT
LAMP
NO AISLE

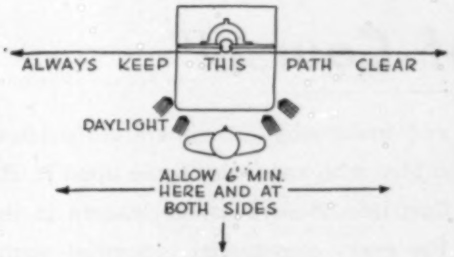
SCROLL SAW


WINDOWS
12" OR LESS
DAYLIGHT
LIGHT OVER OPERATOR
5'-4"
45°

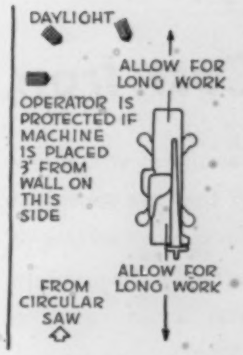
WOOD LATHE


WALL MAY BE HERE
LIGHTED SHIELDS ELIMINATE NECESSITY FOR GOOD DAYLIGHT
OTHER MACHINES MAY BE CLOSE EITHER SIDE
WIDE AISLE MAY BE HERE

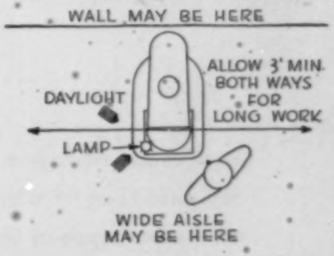
GRINDER


ALWAYS KEEP THIS PATH CLEAR
DAYLIGHT
ALLOW 6' MIN. HERE AND AT BOTH SIDES

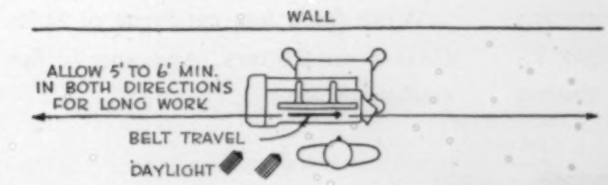
SHAPER


DAYLIGHT
ALLOW FOR LONG WORK
OPERATOR IS PROTECTED IF MACHINE IS PLACED 3' FROM WALL ON THIS SIDE
ALLOW FOR LONG WORK
FROM CIRCULAR SAW

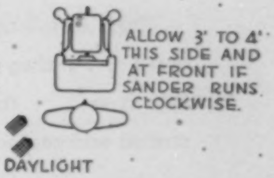
JOINTER


WALL MAY BE HERE
ALLOW 3' MIN. BOTH WAYS FOR LONG WORK
DAYLIGHT
LAMP
WIDE AISLE MAY BE HERE

DRILL PRESS


WALL
ALLOW 5' TO 6' MIN. IN BOTH DIRECTIONS FOR LONG WORK
BELT TRAVEL
DAYLIGHT

BELT SANDER


ALLOW 3' TO 4' THIS SIDE AND AT FRONT IF SANDER RUNS CLOCKWISE.
DAYLIGHT

DISC SANDER

Drawings of machinery on this and page 121 are reproduced at 1/4 in. = 1 ft. scale. Architects, in planning shop layouts, may find it helpful either to trace directly over these reproductions or use them, cut out on cardboard mounting, as templates. Data and recommendations are for general guidance; particular situations may require appropriate modifications. Drawings on this page were based on drawings and data from the Delta Mfg. Co., Milwaukee. For additional information see Delta Booklet "How to Plan a School Workshop"

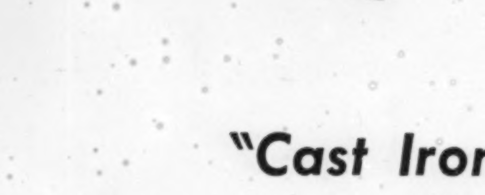
"Cast Iron, of Course!"

Real estate management executives who know say *cast iron* — whenever they are consulted on the best type of boiler for a new building or for replacement. For experience has taught them these important facts about cast-iron boilers:

They last longer — their cost per year is lower . . . they successfully resist corrosion and rust . . . they are sectional — easily installed and replaced . . . they are easily cleaned and maintained at consistently lower cost.

Men who know also agree upon H. B. Smith Cast-Iron Boilers as the leaders in the field. For every commercial, industrial, institutional or residential use, for all fuels and fuel-burning methods, they recommend them without hesitation.

Write for a free catalogue of H. B. Smith *Cast-Iron* Boilers. And specify them with confidence, always.



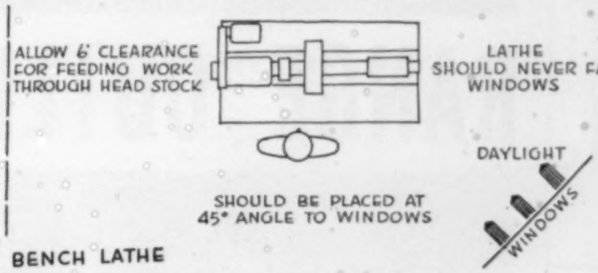
H.B. Smith

CAST-IRON BOILERS

THE H. B. SMITH CO., INC., WESTFIELD, MASS. **Offices and Representatives in Principal Cities**

ARCHITECTURAL ENGINEERING
TECHNICAL NEWS AND RESEARCH

SCHOOL SHOP EQUIPMENT: METALWORKING

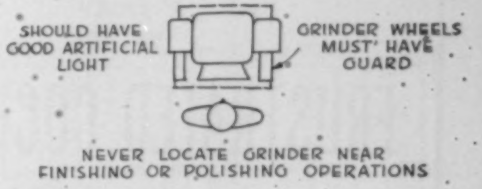


ALLOW 6' CLEARANCE FOR FEEDING WORK THROUGH HEAD STOCK

LATHE SHOULD NEVER FACE WINDOWS

SHOULD BE PLACED AT 45° ANGLE TO WINDOWS

BENCH LATHE

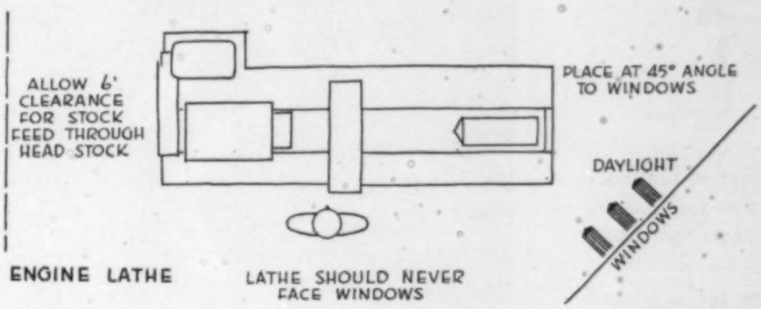


SHOULD HAVE GOOD ARTIFICIAL LIGHT

GRINDER WHEELS MUST HAVE GUARD

NEVER LOCATE GRINDER NEAR FINISHING OR POLISHING OPERATIONS

TOOL GRINDER

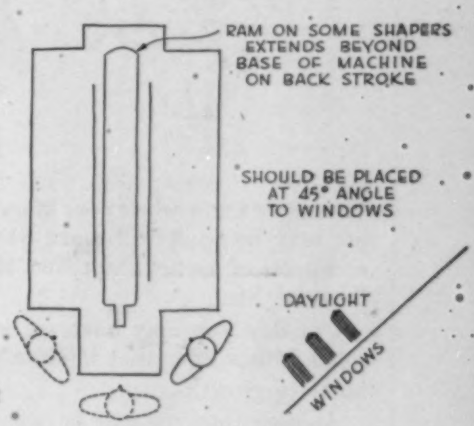


ALLOW 6' CLEARANCE FOR STOCK FEED THROUGH HEAD STOCK

PLACE AT 45° ANGLE TO WINDOWS

ENGINE LATHE

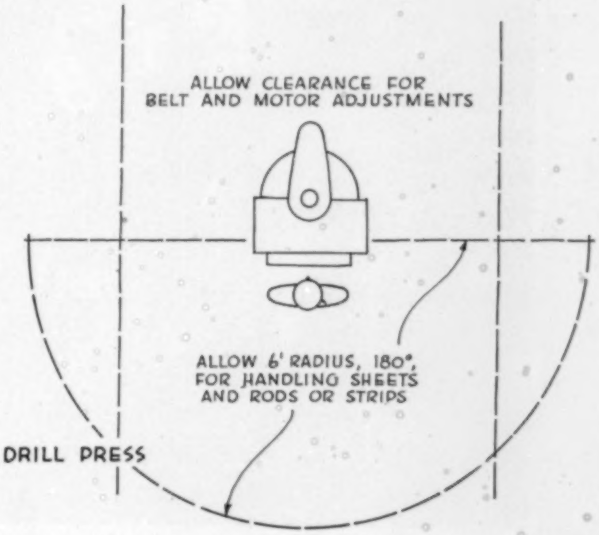
LATHE SHOULD NEVER FACE WINDOWS



RAM ON SOME SHAPERS EXTENDS BEYOND BASE OF MACHINE ON BACK STROKE

SHOULD BE PLACED AT 45° ANGLE TO WINDOWS

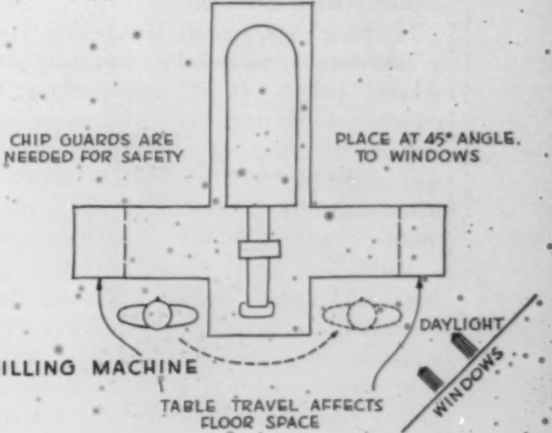
SHAPER



ALLOW CLEARANCE FOR BELT AND MOTOR ADJUSTMENTS

ALLOW 6' RADIUS, 180°, FOR HANDLING SHEETS AND RODS OR STRIPS

DRILL PRESS



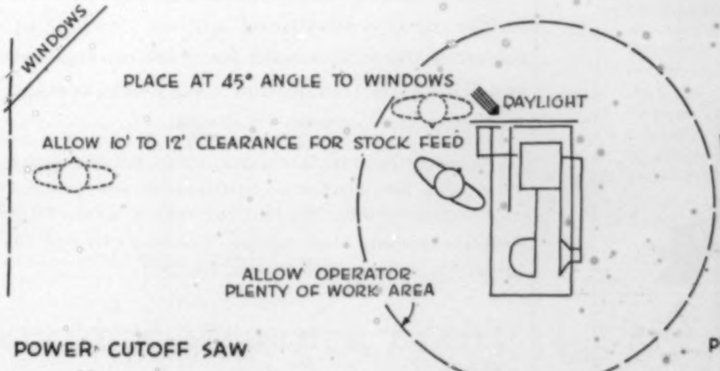
ALLOW CLEARANCE FOR SERVICE-ACCESS DOORS

CHIP GUARDS ARE NEEDED FOR SAFETY

PLACE AT 45° ANGLE. TO WINDOWS

MILLING MACHINE

TABLE TRAVEL AFFECTS FLOOR SPACE

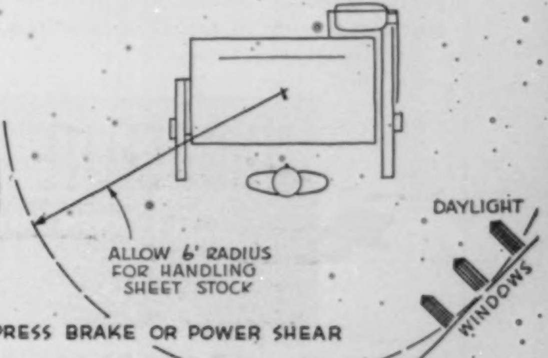


PLACE AT 45° ANGLE TO WINDOWS

ALLOW 10' TO 12' CLEARANCE FOR STOCK FEED

ALLOW OPERATOR PLENTY OF WORK AREA

POWER CUTOFF SAW



ALLOW 6' RADIUS FOR HANDLING SHEET STOCK

PRESS BRAKE OR POWER SHEAR

Drawings on this page were prepared by Homer H. Dasey, President, Visual Production Planning, Inc., New York City, makers of two-dimensional templates and three-dimensional models, at ¼ in. = 1 ft, scale, of industrial machinery and equipment

Take the case of the

INHIBITED MOLD

vs. the

FRUSTRATED COCKROACH

You never know when your knowledge of Hubbellite may be what will make you the fair-haired architect of some client for the rest of your financial life.

One day you may have an order for a locker room with a floor that inhibits many molds and bacteria growths.

Another time you may be called on for a kitchen floor. One which repels roaches. And, which also withstands foods and fats that ordinarily dissolve resilient floor surfaces.

In either case, specify Hubbellite. Hubbellite is a cupriferous, monolithic surfacing available in several colors. It is non-sparking, static-safe, resistant to neutral oils and greases, non-dusting and non-denting under ordinary point loads. It will stand up well under foot traffic and light wheeled units common in most plants. Most unique of all—it inhibits molds and repels roaches.

Hubbellite is an unrivaled floor surface for hospitals, locker rooms, kitchens, floors where explosion is a hazard or where solvents have to be resisted. This sounds like a big mouthful. The best way to check up on Hubbellite is to write, giving your particular interest or ask for complete literature for your file. We have tests from impartial scientific laboratories made on Hubbellite and also reports of actual installations.

HUBBELLITE

IS SOMETHING TO KNOW ABOUT

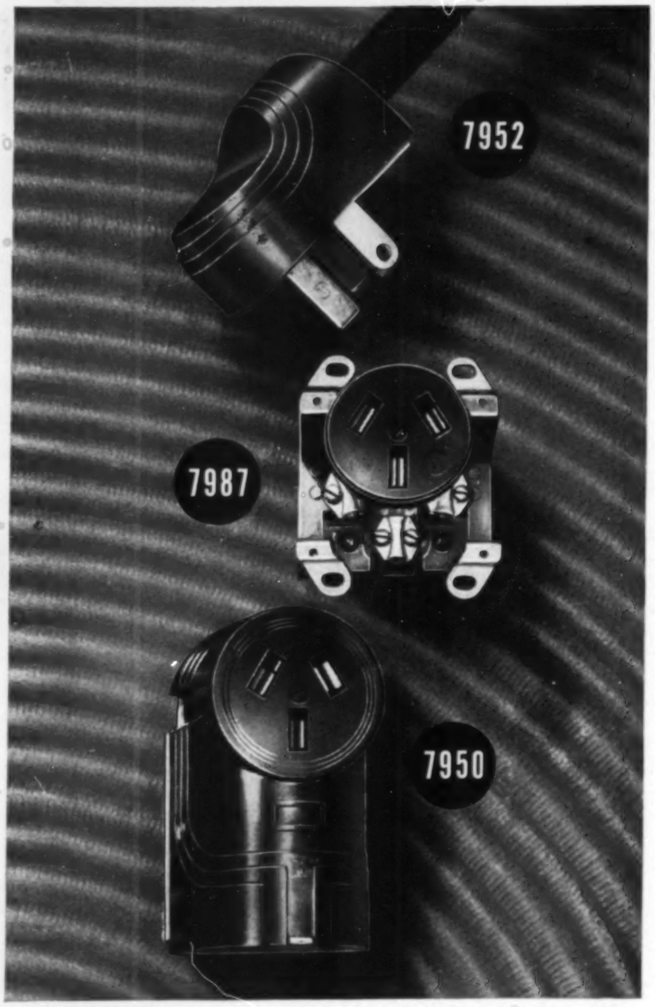
H. H. ROBERTSON CO.

2404 Farmers Bank Building
Pittsburgh 22, Pennsylvania

Offices in 50 Principal Cities
World-Wide Building Service

H&H THREE-WIRE 50 AMP., 250 V.

RANGE OUTLETS



These quickly-wired Outlets and Caps have every improved feature for easy installation *and use.* Straight-in wiring with solderless connectors make fast work of range hook-ups. Cap and Receptacle combination make a neat, compact installation with attractive harmony of design.

Range Cap No. 7952 is of polished black Bakelite, designed to match the Receptacles. Range Outlet No. 7950 is surface type; polished black Bakelite. Also available in white Ivorylite: No. 7950-I. Range Outlet No. 7987 is flush type; polished black Bakelite. If wanted with .040" brush brass plate, specify No. 7990; with .060" plate, No. 7991.

HART & HEGEMAN DIVISION

ARROW-HART & HEGEMAN ELECTRIC COMPANY, HARTFORD 6, CONN., U. S. A.

SCHOOL SHOP SAFETY LEGISLATION

TABLE 1

*State Legislation Affecting School Shop Design**

STATE / QUESTION	Are school buildings of more than one story required by law to have fire escapes or "fire safe" stairs?	Is it required by law that doors of school rooms swing outward?	Is it required by law that all outside doors of school buildings be of such construction that they can be unlocked from inside without key?
Alabama	yes	no	no
Arizona	no	yes	no
Arkansas	no	(2)	no
California	yes	no	no
Colorado	yes	yes	yes
Connecticut	no	yes	yes
Delaware	yes	yes	yes
Florida	yes	yes	yes
Georgia	yes	yes	no
Idaho	yes	yes	no
Illinois	yes	yes	yes
Indiana	yes	yes	yes
Iowa	yes	yes	yes
Kansas	yes	yes	no
Kentucky	yes	yes	no
Louisiana	yes	yes	(4)
Maine	..	..	..
Maryland	yes	yes	yes
Massachusetts	yes	yes	yes
Michigan	yes	yes	no
Minnesota	no	no	no
Mississippi	yes	yes	no
Missouri	yes	yes	yes
Montana	yes	yes	no
Nebraska	yes	yes	yes
Nevada	no	no	no
New Hampshire	no	yes	yes
New Jersey	yes	yes	yes
New Mexico	yes	no	yes
New York	yes	(3)	yes
North Carolina	yes	yes	yes
North Dakota	..	..	..
Ohio	yes	yes	yes
Oklahoma	yes	yes	no
Oregon	yes	yes	yes
Pennsylvania	yes	yes	yes
Rhode Island	(1)	(2)	yes
South Carolina	yes	yes	yes
South Dakota	yes	yes	yes
Tennessee	no	yes	yes
Texas	yes	yes	no
Utah	(2)	yes	yes
Vermont	yes	yes	yes
Virginia	yes	yes	yes
Washington	yes	yes	no
West Virginia	yes	yes	yes
Wisconsin	yes	yes	yes
Wyoming	yes	yes	..

* *Compiled by the National Safety Council.*

Key to Figures

(1) Three or more stories permitted before such protection required.
(2) Not required by law but is common practice.
(3) Doors required to swing inward.
(4) Not required by law, but all exits must be approved by state fire marshal.

TABLE 2

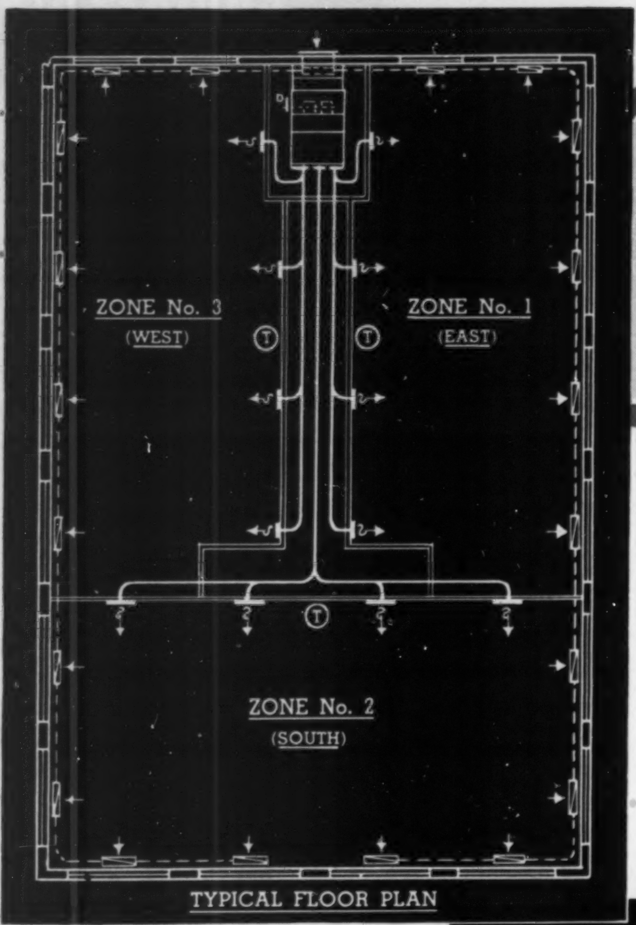
*State Labor Regulations Affecting School Shop Design**

STATE / QUESTION	Do you have State Labor Regulations for industrial plants governing illumination?	Do you have State Labor Regulations for industrial plants governing ventilation?	Do you have State Labor Regulations for industrial plants governing temperature control?	Does the jurisdiction of your department extend to include the industrial arts and the vocational education shops of the schools?	
Alabama	yes	yes	yes	yes	(4)
Arizona	yes	yes	yes	yes	(4)
Arkansas	no	yes	yes	yes	
California	yes	yes	yes	yes	(4)
Colorado	..	..	..	..	
Connecticut	..	..	..	..	
Delaware	yes	yes	yes	no	
Florida	(2)	(2)	(2)	(2)	
Georgia	yes	yes	yes	yes	
Idaho	no	no	no	no	
Illinois	no	yes	no	no	(5)
Indiana	..	..	..	..	
Iowa	yes	yes	yes	yes	
Kansas	yes	yes	yes	yes	
Kentucky	yes	yes	yes	..	
Louisiana	no	yes	yes	no	
Maine	..	..	..	..	
Maryland	yes	yes	..	yes	(4)
Massachusetts	yes	yes	yes	no	
Michigan	yes	yes	yes	yes	(4)
Minnesota	yes	yes	no	yes	
Mississippi	no	yes	no	no	
Missouri	yes	yes	yes	no	
Montana	no	no	no	no	
Nebraska	no	yes	no	yes	(4)
Nevada	no	no	no	yes	(4)
New Hampshire	yes	yes	yes	no	(5)
New Jersey	yes	yes	yes	no	(5)
New Mexico	..	..	..	..	
New York	yes	yes	yes	no	(5)
North Carolina	yes	yes	yes	no	
North Dakota	..	..	..	..	
Ohio	yes	yes	yes	yes	
Oklahoma	yes	yes	yes	yes	
Oregon	yes	yes	yes	yes	(4)
Pennsylvania	yes	yes	yes	yes	
Rhode Island	..	..	..	..	
South Carolina	..	..	..	..	
South Dakota	(1)	(1)	(1)	(1)	
Tennessee	yes	yes	yes	no	(5)
Texas	no	yes	yes	no	
Utah	yes	yes	yes	yes	(4)
Vermont	..	..	..	..	
Virginia	yes	yes	no	yes	
Washington	yes	yes	yes	..	
West Virginia	yes	yes	no	no	(5)
Wisconsin	yes	yes	yes	yes	(4)
Wyoming	no	(3)	no	yes	(4)

* *Compiled by the National Safety Council.*

Key to Figures

(1) No state department of labor.
(2) No safety code in state at present.
(3) Safety code governs situation in mines.
(4) To protect employees (teachers) of school only.
(5) But inspectors are at liberty to make inspection.


ZONE No. 3
(WEST)
ZONE No. 1
(EAST)
T
T
T
ZONE No. 2
(SOUTH)

TYPICAL FLOOR PLAN

ZONE CONTROL using CLARAGE "Blow-Thru" Multitherms

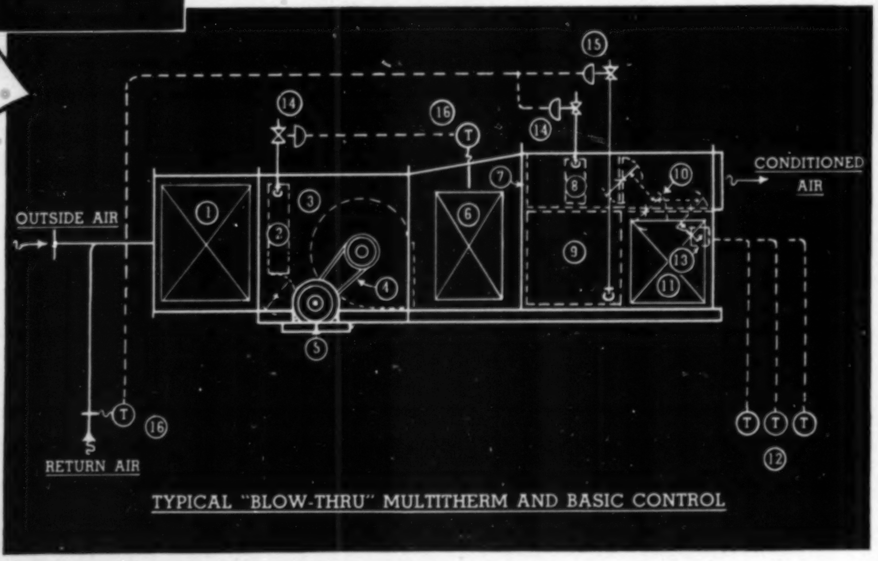
Now one Clarage "Blow-Thru" Multitherm Unit can be used to air condition various parts of your building exactly as requirements warrant. A typical 3-zone installation is shown at left. Unit can be arranged to serve from two to six zones — an exclusive Clarage development.

ZONE CONTROL compensates for the difference in solar radiation on different parts of a building during different periods of the day. It also takes into account variations in exposure, wind velocity, construction, and internal heat loads.

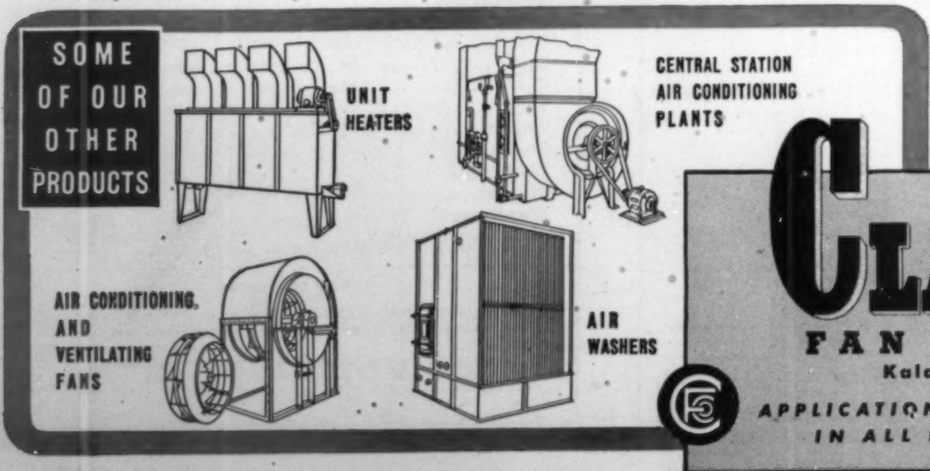
Thus winter and summer, if desired, you can maintain various temperatures in various parts of your building. Each zone is automatically controlled independently — yet only one conditioning unit necessary!

EQUIPMENT ARRANGEMENT

1. Filter Section
2. Tempering Coil with Steam Distributing Tubes
3. Fan Section
4. V-Belt Drive
5. Motor
6. Fan Discharge Section with Access Door
7. Distributing Plate
8. Reheat Coil with Steam Distributing Tubes
9. Cooling Coil
10. Zone Double Mixing Dampers (3 sets)
11. Access Door
12. Zone Room Thermostats
13. Zone Damper Motors
14. Steam Valve
15. Cold Water or Refrigerant Valve
16. Temperature Controller


15
14
16
14
T
OUTSIDE AIR
1
2
3
4
5
6
7
8
9
10
11
13
CONDITIONED AIR
T
16
RETURN AIR
T T T
12

TYPICAL "BLOW-THRU" MULTITHERM AND BASIC CONTROL

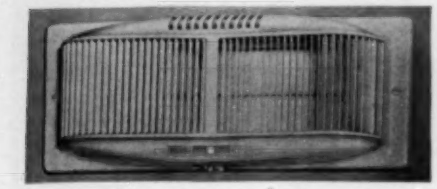

SOME OF OUR OTHER PRODUCTS
UNIT HEATERS
CENTRAL STATION AIR CONDITIONING PLANTS
AIR CONDITIONING, AND VENTILATING FANS
AIR WASHERS

Clarage ZONE CONTROL air conditioning is adaptable to practically any type of building — industrial, commercial, etc. Write for further data.

CLARAGE
FAN COMPANY
Kalamazoo, Michigan

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

PRODUCTS for Better Building



Automatic register for warm air control

AUTOMATIC REGISTER

Individual room control of warm air heat is promised by the *Grad-U-Flow* register without the necessity of elaborate control systems. A self-contained unit no larger than the conventional warm air outlet, it requires no electrical power. In operation, a bulb mounted under a cover on the front of the grille reacts to changes in room air temperature and causes a bellows to expand or contract. By means of levers the bellows opens or closes the grille dampers to maintain a constant temperature. A screw mechanism which alters the balance point of the levers permits selection of the temperature level desired for the individual room. Curved to permit even distribution of air, the grille is equipped with turning vanes which insure smooth and quiet operation. When production arrangements have been completed, the register will be offered for installation in new homes and in existing dwellings equipped with forced warm air heating systems. Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., South, Minneapolis 8, Minn.

WATERPROOFING

In the final stages of drying, the waterproofing preparation *Kay-Tite* expands and sets with extreme hardness, to form an impermeable masonry seal. According to the manufacturer, this material is applied like paint to walls which have been thoroughly soaked, and in the process of drying out it is sucked in to bond with the wall surface. No further surface finish is required, as it is smooth, washable and grime-resisting. When laying cement floors on ground level, it is also stated that the waterproofing may be sprinkled over the surface of the cement, and troweled into the finished surface to make it watertight, and increase surface hardness. Kay-Tite, West Orange, N. J.

ALUMINUM PANELS

Permanent rigidity, imperviousness to moisture, and light weight are achieved in *Reynalite*, a new aluminum panel material. In this product two sheets of aluminum are bonded to a cellulose core by means of a plastic adhesive. The material is said to be uniform in quality, lightning and fire resistant, insect proof, and to have high insulating value. Wood veneers can be bonded to either or both of the metal surfaces. Fastened with ordinary nails or screws, it may be worked with the usual carpenter tools. Tests have indicated this material suitable for the construction of walls, partitions, ceilings, roofs, interior panels and cabinets. Reynolds Metals Co., Aluminum Division, 2500 South Third St., Louisville 1, Ky.

INSULATING GLASS

Air spaces in *Twindow*, the new double-glazed window unit are hermetically sealed to effect thermal and dust insulation, and prevent condensation. Hollow aluminum tubing separates the glass plates and holds them in position, while a stainless steel channel encloses edges of glass and tubing for maximum protection during installation and use. Two or more plates of glass enclosing ¼ in. or ½ in. air spaces are declared virtually to prevent condensation, thus permitting use of larger windows, and to reduce heating and air conditioning costs. The standard unit is made with clear polished plate glass, but for special purposes units can be made employing heat-absorbing, water white, laminated safety, heat-tempered or other special glass. Available in a wide range of sizes in any combination of straight edges, with standard double glazing. Special triple, quadruple and multiple glazed panels can also be produced, as well as simple cylindrical bends within definite limitations. Dept. PRT, Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

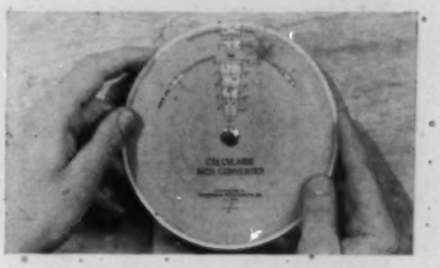
GLASS FIREPLACE SCREEN

Dirt, soot, fumes, smoke and sparks are effectively prevented from getting out into the room by *Thermo-Lite*, the new glass fireplace screen. Made with a polished brass finish frame, the glass is especially heat treated to withstand temperatures up to 650° F. The fixture is made in 10 sizes to fit standard fireplaces without adjustment, and flanges permit variations to accommodate openings slightly larger or smaller than standard. Draft is controlled by sliding doors in the base. Merryweather Products Co., Akron 8, Ohio.

Fireplace screen of heat-treated glass

ALUMINUM ROOF PAINT

An asphalt base roof paint contains aluminum paste to form a reflecting, protective covering that gives longer life for the surface and reduces inside temperatures. When the paint is applied the aluminum pigment rises to the surface to form a foil-like, metallic shield against the elements. Eighty per cent of the sun's rays are said to be reflected. Suitable for use on smooth or slate roll roofing, asphalt shingles, built up, slag or metal roofs, it is also made for outside metal work such as tanks, flashings and iron fences. The paint is packaged ready for use and may be applied with brush or spray gun. Dry within an hour, the surface can be used in three to four hours after application. United Gilsonite Laboratories, Scranton 1, Pa.



Fast-working inch converter of plastic

CIRCULAR INCH CONVERTER

Fractions of an inch are simply converted into decimals or millimeters, and corresponding U. S. standard gage numbers and drill numbers revealed, by use of the *Calculaide* inch converter. Only 5¾ in. in diameter, the device has decimal equivalents graduated in .001 in., and metric equivalents graduated in .1 mm. Range is from 0 to 100 mm. Graduations are reproduced on facing surfaces and protected with a plastic lamination. The non-warping, non-inflammable plastic instrument is unaffected by moisture, perspiration or ink. Directions are printed on the back. American Hydromath Co., 145 West 57th St., New York, N. Y.

STEAM BOILERS

Standard water tube boilers, the new *Springfield Type M* series, ranging in steam generating capacity from 6,000 to 17,000 pounds of steam per hour feature a water-cooled furnace design found particularly successful where it is necessary to maintain uniformly high efficiency over a wide range of load conditions. Erection is facilitated by

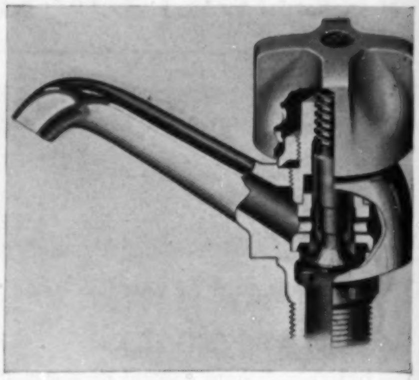
(*Continued on page 126*)

(Continued from page 125)

shop assembly of a considerable portion of the parts, and provision of complete framing to receive standard dimension refractory and insulating materials. Dimensions for various size units have been standardized. Designed for automatic firing, the boilers are stated to be simple to maintain and to be able to operate considerably above rated capacity. Heat applied to steam delivery tubes and steam delivery above water level are features intended to insure very dry steam and freedom from priming. Springfield Boiler Co., 1991 E. Capitol Ave., Springfield, Ill.

NON-DRIP FAUCETS

Easy operation and easy repair were incorporated in the design of the new non-drip faucets, *Dialese.* Shutting off the valve mechanism in the same direction as water flow allows the water pressure to aid in closing the valve and prevent dripping. By placing the packing between the threads and the chamber through which the water flows, it has been possible to lubricate the stem threads without risk of its washing away, and also to prevent the possibility of liming corrosion of the threads. For simplicity of repair a cartridge control unit is used, standard for all faucets of this design, which is easily and quickly removed. A spare cartridge may be substituted for any cartridge in need of repair, and the damaged or worn parts in the removed cartridge can be replaced or repaired at a later time. Pearl grey plastic handles and base coverings are standard with these fixtures. These handles are insulated, so that they will not get uncomfortably hot, no matter what the water temperature may be. They are stated to be capable of supporting hard wear, high temperatures and ordinary cleaning agents, and to be unaffected by acids or medicines. Crane Co., 836 South Michigan Ave., Chicago 5, Ill.



New faucet designed to prevent dripping

SAFETY OUTLET CAP

A plastic cap for electrical outlets, the *Amerline* safety cap, is offered to protect against possible accidental shocks and also to exclude dust and moisture from the outlets. It fits snugly into 110 or 220 volt openings, yet is easily removed. The cap is recommended especially where children are likely to play around outlets. Amerline-Chicago, 1753 North Honore St., Chicago 22, Ill.

FUNGICIDES

A line of fungicide concentrates, the *Nuocides*, has been developed to meet a wide variety of mildew and rot proofing needs. For ease and safety of handling, these fungicides are solutions or liquid emulsion bases, and include both solvent and water soluble types. Some components arrest or inhibit microbial growth, while others destroy them. It is asserted that with their use a high degree of resistance to mildew and rotting can be imparted to rope, textiles, lumber and other products. Nuodex Products Co., Inc., 796 Magnolia Ave., Elizabeth F., N. J.

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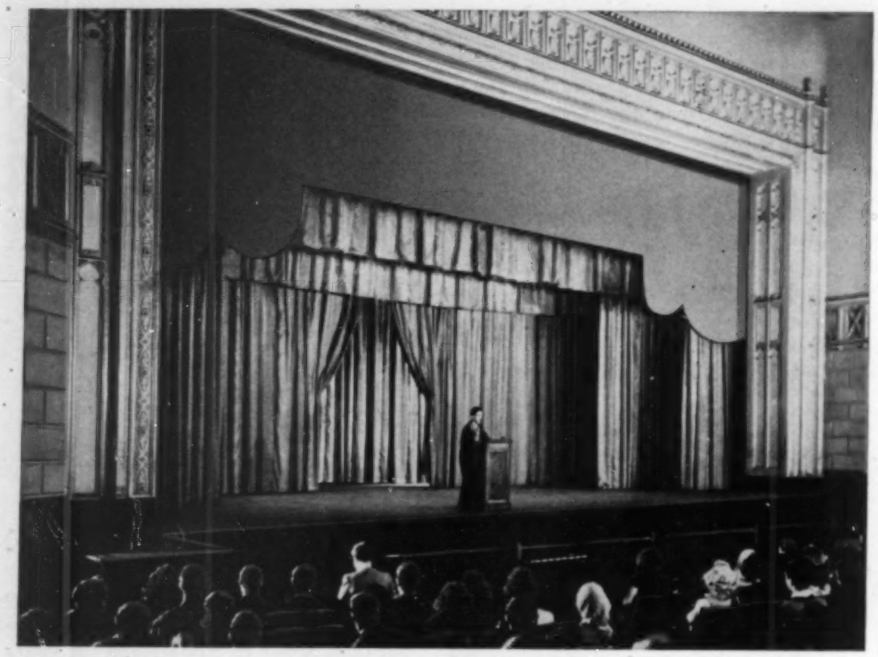


SCHOOL BUDGETS
cannot pay for LOST LIVES!

ROOSEVELT HIGH SCHOOL, Chicago, Ill., auditorium entirely redecorated with Fiberglas fabrics. Photograph shows the stage treatment in jade green grosgrain weave. Fiberglas fabrics afford excellent acoustical properties as well as fire-safety.

FIBERGLAS* Listed by Underwriters' Laboratories, Inc., as "Non-Combustible Fabric;" approved by the Bureau of Standards and Appeals, City of New York.

No single item is more important than the sum set aside for fire protection. Yet in spite of all precautions an unavoidable accident may turn a laughing, happy throng of children into a frenzied, screaming riot during which precious lives may be lost. That is why school authorities in New York, Chicago, St. Louis and other cities are specifying Fiberglas* curtains and draperies for auditorium use. For these attractive fabrics CANNOT BURN. Woven entirely of finely spun glass filaments, *they never require flame-proofing;* always operate at 100% efficiency. Will not emit choking fumes when exposed to fire.

Fiberglas fabrics are endorsed by public safety officials in the United States and abroad for use in all places of public assembly. Installed in all ships of the U. S. Navy (Bureau of Ships Specification 27c7). Now available in a wide range of solid colors, printed patterns and interesting textures.

WRITE FOR SAMPLES AND INFORMATION

THORTEL
FIREPROOF FABRICS

ARCHITECTS BUILDING, 101 PARK AVENUE, NEW YORK 17, N. Y. • LEXINGTON 2-0711

*T. M. Reg. U. S. Pat. Off. Owens-Corning Fiberglas Corporation

When the blueprints call for RADIANT HEATING . . .

here's why you'll want *Copper Tube*

YOU'RE designing for *lasting* appreciation. So, for the radiant heating system, be sure to include *copper tube* in your specifications. The great durability and long-range economy of Chase Copper Tube mean a satisfied client, and satisfied clients build business and prestige for you.

You boost your stock with heating contractors, too, when the specifications call for Chase Copper Tube. It's easy to bend, light in weight, comes in long lengths, and is sold through plumbing and heating wholesalers throughout the country.

The demand for Chase Copper Water Tube is so great that we are not able to satisfy it at all times. However, the technical information is now available to you for future planning. For a complimentary copy of our new handbook write, on business letterhead, to Dept. AR-76.

7 Reasons

WHY CHASE COPPER TUBE FOR RADIANT HEATING

1. *EASY TO BEND*
2. *LIGHT IN WEIGHT*
3. *SOLDERED FITTINGS*
4. *SMALL DIAMETERS*
5. *LONG LENGTHS*
6. *LOW COST*
7. *LONG LIFE*

Chase
BRASS & COPPER CO.
INCORPORATED

Waterbury 91, Connecticut
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

This is the Chase Network—handiest way to buy brass

ALBANY† ATLANTA† BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT HOUSTON† INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WASHINGTON† *(†Indicates Sales Office Only)*

(*Continued from page 126*)

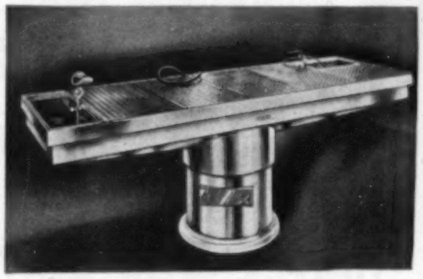
PLASTIC-COATED WALLPAPER

Included in the more than 1000 new patterns of wallpaper offered by the manufacturer are 75 styles of the new plastic-coated wallpaper, *Varlar*, in pattern and texture effects. The plastic coating which combines with the plastic content of the surface of the wallpaper eliminates the possibility of cracking or peeling, and produces a surface that has tested to be 50 times more washable than regular wallpaper. Spots and stains of all kinds may be easily washed away. Supple and flexible, it may be hung as easily as any good quality, regular wallpaper. Single rolls are 24 ft. long and 18 in. wide. United Wallpaper Inc., Merchandise Mart, Chicago, Ill.

SAFETY-TOP ELECTRIC RANGE

Increased safety is feature of new range

Cooking units are placed in a row across the rear of the *Presteline* electric range, thus setting them out of the reach of young children, and also eliminating the possibility of scalded arms for the housewife in reaching across front units. This new range incorporates the latest developments for utility and efficiency in operation. Pressed Steel Car Co., Inc., Domestic Appliance Division, Chicago, Ill.


New autopsy table can be rotated on base

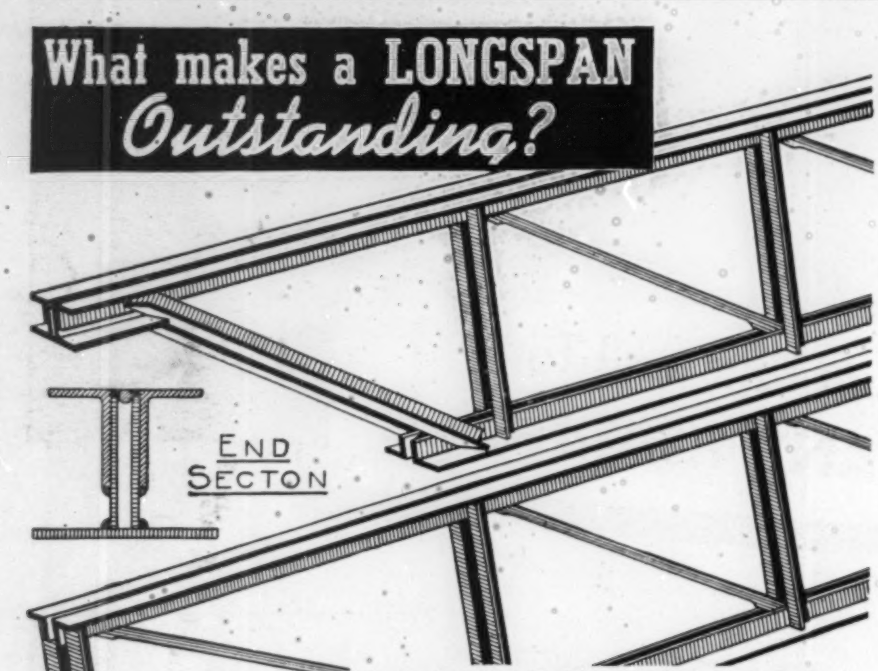
AUTOPSY TABLE

Mounted on a circular pedestal base which permits rotating through a 90° arc, the new *Boston* autopsy table incorporates all essential features for satisfactory use. The table is made of stainless steel, and the top is equipped with five removable perforated panels, one of which is fitted with a headrest, while another has a sponge bowl as an integral part. Long edges of the table are graduated in centimeters. All plumbing fixtures and waste outlets are concealed from view in the pedestal, yet are accessible through a removable panel. An aspirator is optional. All welded joints are ground and polished, thus rendering surfaces seamless for easy cleaning. Hospital Equipment Division, Market Forge Co., Garvey St., Everett 49, Mass.

FIBERGLAS ROOFING MAT

For use as a carrying and reinforcing agent for bitumen in roofing applications, a *Fiberglas* roofing mat has been

(*Continued on page 130*)


What makes a LONGSPAN *Outstanding?*

Look for the U-shaped diagonal web. It provides an excellent welding condition and a constant chord spread that results in outstanding lateral rigidity. This exclusive Macomber design is made in underslung or square end types with sloping or parallel chords in lengths up to 70 feet. Here is a completely standardized structural unit, specified from load and span tables for unobstructed floor or roof support. Get our complete design information for your next project.

STEEL JOISTS
ROOF PURLINS
ROOF TRUSSES
LONGSPANS
ROOF DECKING
STEEL SIDING

MACOMBER
CANTON • OHIO
MEMBER OF THE STEEL JOIST INSTITUTE

ASBESTOS IN ACTION

Engineers' Club, Dayton, Ohio
Architects: Schenck & Williams, Dayton, Ohio
Applicator: Myron Cornish & Company, Dayton, Ohio

ONLY **K&M** SPRAYED "LIMPET"* ASBESTOS CAN GIVE YOU ACOUSTICS *And* FULL ARTISTIC FREEDOM

NOISE REDUCTION is a highly desirable feature in the design of modern clubs, restaurants, hotels and cocktail lounges . . . but so is freedom of architectural expression. That's why K&M Sprayed "Limpet" Asbestos is the ideal acoustical material. It assures the required degree of sound absorption, at the same time offering full latitude for carrying out architectural motifs. In the illustration above, for example, notice the many curves and recesses in the pattern of the ceiling. Sprayed "Limpet" Asbestos treats these irregularities as easily as plane surfaces.

Applied easily and quickly by spraying from a "gun", "Limpet" Asbestos sticks tight to any clean surface, *regardless of shape or composition.* It has a noise reduction coefficient of .70 in a ¾" application. It is light in weight, resistant to fire, moisture and vermin. Its thermal conductivity is only .31 at 75° F. It can be given up to 10 coats of paint without noticeably impairing its acoustical efficiency.

Is it any wonder that more and more architects on more and more jobs are specifying Sprayed "Limpet" Asbestos? If it's new to you, it will pay you to investigate it at once.

*Trade-Mark Reg. U. S. Pat. Off.

Nature made Asbestos
. . . Keasbey & Mattison has been making it serve mankind since 1873.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

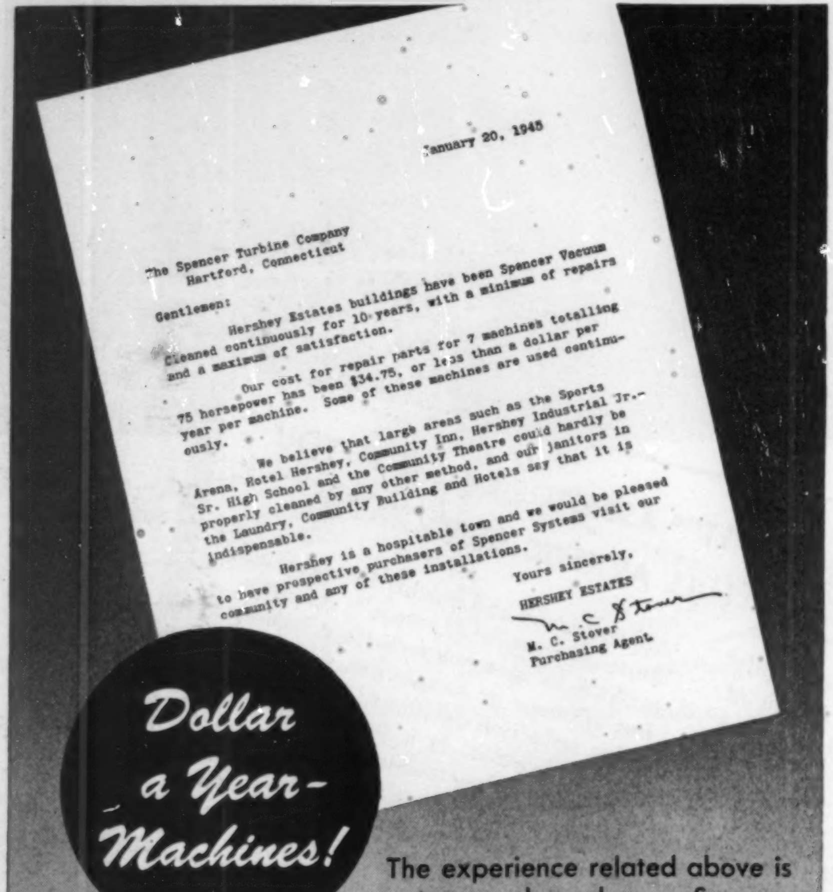
K&M best in asbestos

(*Continued from page 128*)

developed. A uniform felted glass fiber sheet .015 in. thick, it has a breaking strength of 10 to 14 pounds per inch width. The non-cellular structure of the individual glass fibers is unaffected by high-temperature applications of bitumen. An effective reinforced waterproofing is achieved by penetration of the bitumen roofing into the mat. Material is produced in rolls 18 in. and 36 in. wide. Owens-Corning Fiberglas Corp., Toledo, Ohio.

HIGHER FLUORESCENT RATINGS

Increases in the rated light output of 20-watt and 40-watt white and daylight fluorescent lamps have been announced. The initial lumen output per watt of the 20 watt white lamp has been increased from 43 to 46; of the 20 watt daylight lamp from 38 to 40; of the 40 watt white lamp from 52 to 58; and of the 40 watt daylight lamp from 47 to 48. Westinghouse Electric Corp., 306 Fourth Ave., Box 1017, Pittsburgh 30.


January 20, 1945

The Spencer Turbine Company
Hartford, Connecticut

Gentlemen:

Hershey Estates buildings have been Spencer Vacuum Cleaned continuously for 10 years, with a minimum of repairs and a maximum of satisfaction.

Our cost for repair parts for 7 machines totalling 75 horsepower has been $34.75, or less than a dollar per year per machine. Some of these machines are used continuously.

We believe that large areas such as the Sports Arena, Hotel Hershey, Community Inn, Hershey Industrial Jr.-Sr. High School and the Community Theatre could hardly be properly cleaned by any other method, and our janitors in the Laundry, Community Building and Hotels say that it is indispensable.

Hershey is a hospitable town and we would be pleased to have prospective purchasers of Spencer Systems visit our community and any of these installations.

Yours sincerely,
HERSHEY ESTATES
M. C. Stover
M. C. Stover
Purchasing Agent

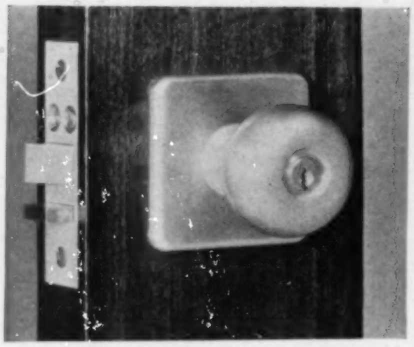
The experience related above is not unusual—and many Spencer Vacuum Systems are in service after 35 years.

Savings in time, decorations, equipment and health pay for the equipment in a few years. Positive, continuous cleanliness is an extra dividend.

Information is available on cleaning all kinds of surfaces and equipment in public, institutional, commercial and industrial buildings.

SPENCER VACUUM CLEANING
HARTFORD
THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.

307C


A cylinder lock that cannot be forced

PRECISION-BUILT LOCK

A shear pin that snaps when someone tries to force the lock by turning the knob with a wrench gives added protection to the *Integralock* cylinder lock, yet leaves the cylinder in the knob in working order for unlocking by key. Made of pressure formed metals with bronze, brass and chrome finishes, the new lock is made in mortise and cutout types. Its self-lubricating, precision designed and machined parts are said to assure long wear and low maintenance. Sargent & Co., New Haven, Conn.

MAGNIFYING LENS

A rectangular, pocket-size magnifier, the Mini-Mag, offers a much larger field of vision than is usually obtained in a magnifier of similar size, of optical glass, the lens is plano-convex, so that by holding the convex side up a flat field with little distortion results. The lens, which is 1¼ in. wide by 2¼ in. long, is framed in lumarith and folds into a handle of the same material. Edroy Products Co., 480 Lexington Ave., New York 17, N. Y.

EXPANSIBLE MEMORIAL

A bronze memorial tablet, the *Opening Door* memorial, never gets out of date, since it provides for the insertion of additional leaves as necessary. The tablet is 25 in. by 32 in., and in the center is a bronze door, which, when opened, reveals sheets of bronze upon which are photo engraved the names of those honored. Five hundred names may be placed on each leaf. Cincinnati Metalcrafts, Inc., 34th and Robertson Ave., Cincinnati 9, Ohio.

SAFETY STANDARDS

A safety blueprint has been prepared covering standards of adequate fire protection, exits and lighting for grandstands, tents and other places of outdoor assembly. Featured sections are construction and capacity of grandstands; location and flameproofing of tents; adequate exits and lighting for all places of outdoor assembly, and protection measures necessary. Natl. Fire Protection Assn., Executive Office, 60 Batterymarch St., Boston, Mass. 25 cents.

HOSPITALS stay modern with SNEAD MOBILWALLS

Change is as inevitable in hospitals as in the science of medicine. Snead Mobilwalls enable a hospital to keep pace with the ever-changing needs of the times, quickly, easily and inexpensively.

Snead Mobilwalls are the outstanding movable steel wall for modern hospital interiors. They combine the privacy, permanent appearance, and soundproofness of fixed masonry walls with instant mobility, flexibility, low upkeep, and complete reusability.

The Memorial Hospital, New York City, provides a significant example of the value of flexible interiors. This modern hospital for the treatment of cancer is equipped throughout with Snead Mobilwalls. The medical and business staffs operate in complete privacy and quiet with easily rearranged flush steel Mobilwalls. This extreme flexibility has already served the hospital many times when rearrangements had to be effected overnight. Small clinic operating rooms, dressing rooms, and examination rooms are of similar construction. Semi-privacy is obtained for ward patients with Snead Mobilscreens. The entire installation was made with 3-inch thick flush Type RF Mobilwalls, finished in a light cream color enamel.

Let us send you complete details and photographs of Snead Mobilwalls and Mobilscreens for hospitals. Our engineers will gladly cooperate in preparing interior plans and specifications, without obligation.

Memorial offers hope for the control of cancer. Give to Memorial Cancer Center Fund, 444 East 68 Street, New York City.

MEMORIAL HOSPITAL
New York
JAMES GAMBLE ROGERS, *Architect*
VERMILYA BROWN & CO., *Builders*

SNEAD & Company . . . . FOUNDED 1849

Designers, manufacturers and erectors of library bookstacks and steel partitions

Sales Office: 96 Pine Street, JERSEY CITY 4, N. J.
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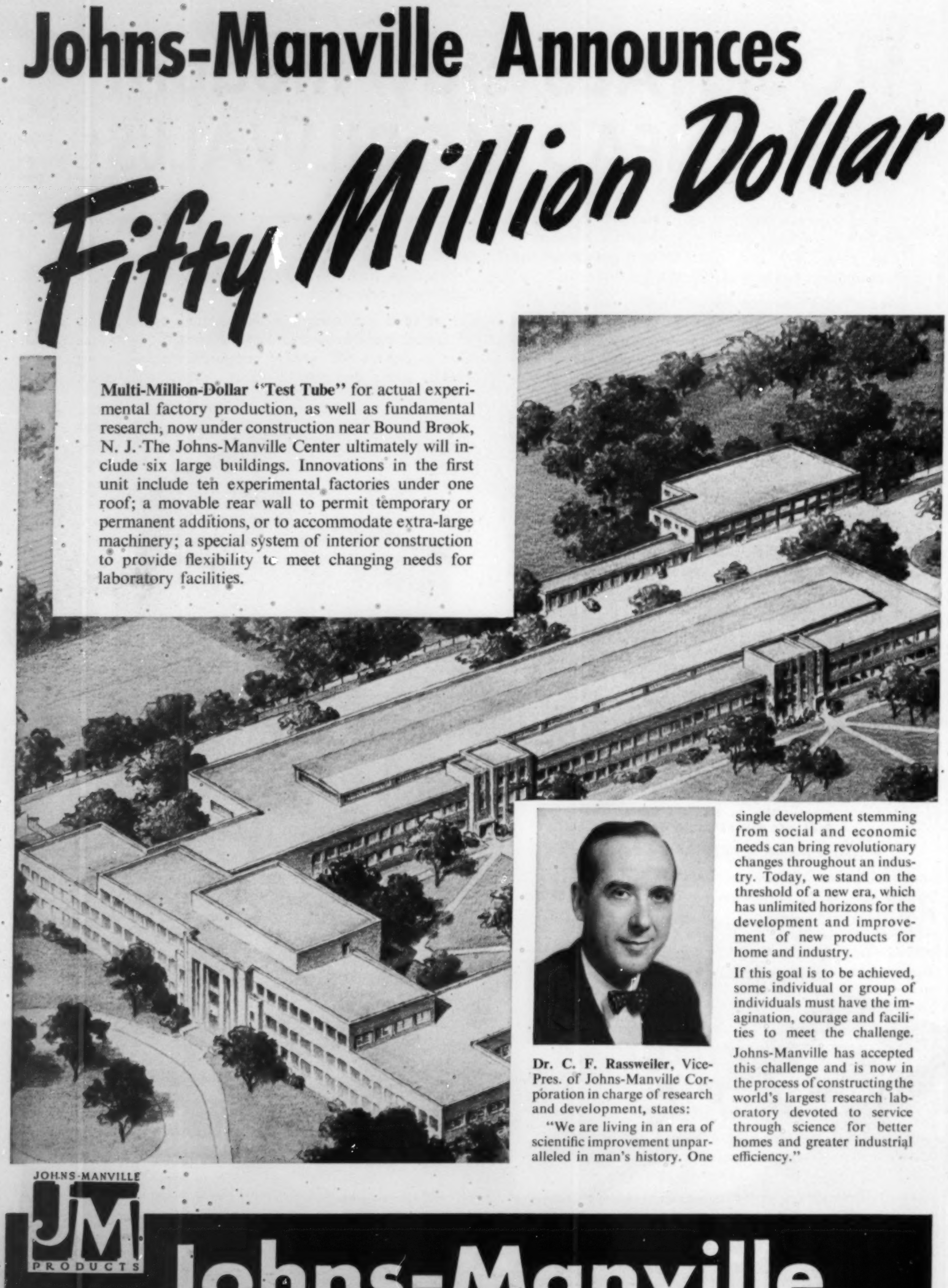


Johns-Manville Announces

Fifty Million Dollar

Multi-Million-Dollar "Test Tube" for actual experimental factory production, as well as fundamental research, now under construction near Bound Brook, N. J. The Johns-Manville Center ultimately will include six large buildings. Innovations in the first unit include ten experimental factories under one roof; a movable rear wall to permit temporary or permanent additions, or to accommodate extra-large machinery; a special system of interior construction to provide flexibility to meet changing needs for laboratory facilities.

Dr. C. F. Rassweiler, Vice-Pres. of Johns-Manville Corporation in charge of research and development, states:

"We are living in an era of scientific improvement unparalleled in man's history. One single development stemming from social and economic needs can bring revolutionary changes throughout an industry. Today, we stand on the threshold of a new era, which has unlimited horizons for the development and improvement of new products for home and industry.

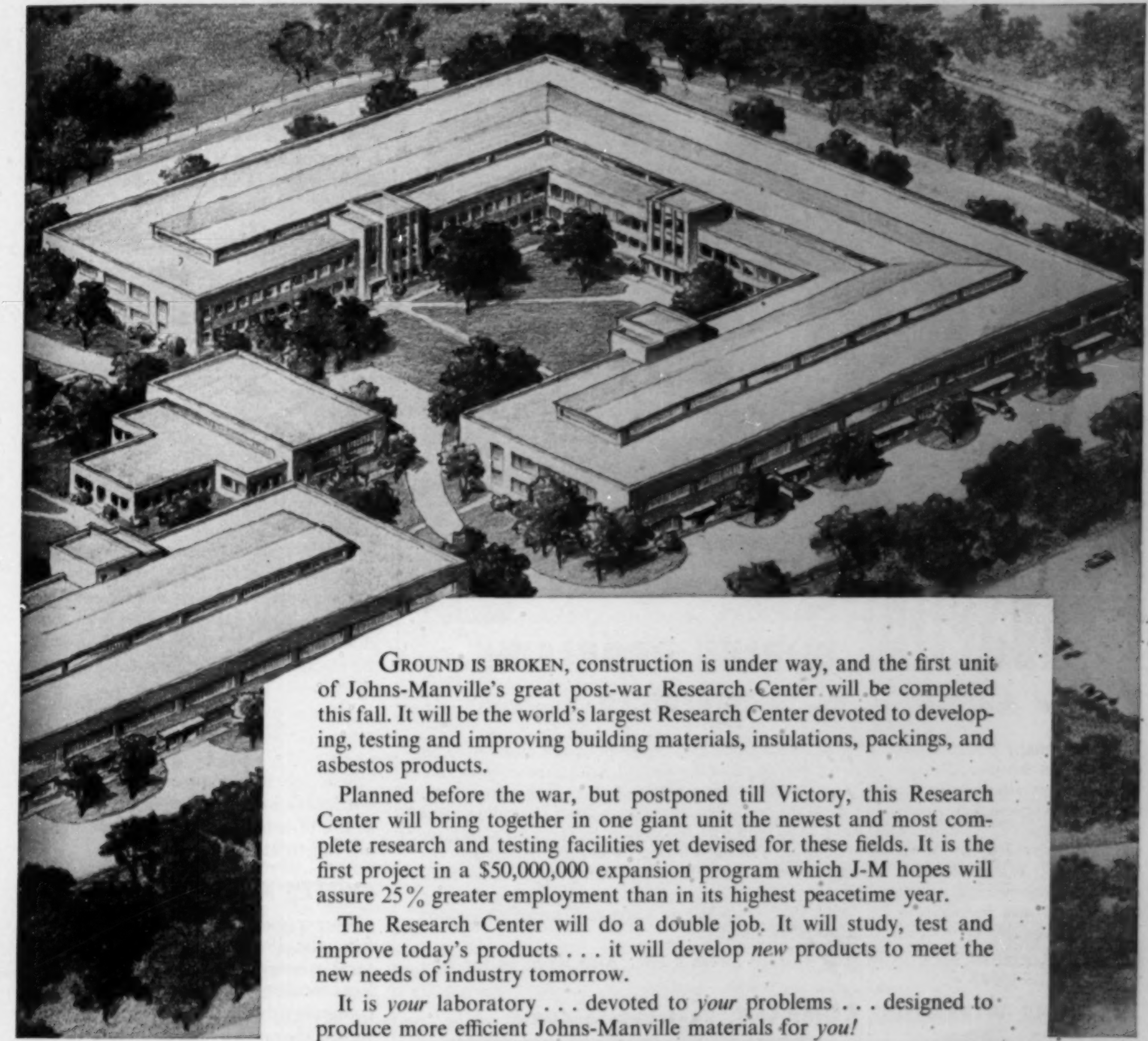
If this goal is to be achieved, some individual or group of individuals must have the imagination, courage and facilities to meet the challenge. Johns-Manville has accepted this challenge and is now in the process of constructing the world's largest research laboratory devoted to service through science for better homes and greater industrial efficiency."

JOHNS-MANVILLE
JM
PRODUCTS

Johns-Manville

Expansion Program

to include World's Largest Research Center for Building Materials and Asbestos Products



GROUND IS BROKEN, construction is under way, and the first unit of Johns-Manville's great post-war Research Center will be completed this fall. It will be the world's largest Research Center devoted to developing, testing and improving building materials, insulations, packings, and asbestos products.

Planned before the war, but postponed till Victory, this Research Center will bring together in one giant unit the newest and most complete research and testing facilities yet devised for these fields. It is the first project in a $50,000,000 expansion program which J-M hopes will assure 25% greater employment than in its highest peacetime year.

The Research Center will do a double job. It will study, test and improve today's products . . . it will develop *new* products to meet the new needs of industry tomorrow.

It is *your* laboratory . . . devoted to *your* problems . . . designed to produce more efficient Johns-Manville materials for *you!*

Manufacturers of 1200 Products for Home and Industry

advise and assist ex-G.I.'s interested in purchasing homes and businesses. Already functioning, the service is under the direction of John B. Waltz, Jr., a veteran of five European campaigns and holder of the Silver Star. Sponsor is Roy A. Heymann, of Heymann and Brother, Philadelphia real estate firm.

The new service offers to help veterans find homes and business locations and advise them on the relative values of either or both. Also offered is help in investigating home and business potentialities in relation to location, advice against unsound ventures, counsel on alterations and improvements, etc.

HOUSING DEPARTMENT

A separate Housing Department has been established by the New York Life Insurance Company under the direction of O. L. Nelson, assistant secretary. G. Harmon Gurney has been named chief architect for housing.

The company already has announced two housing projects which are now under development: the Fresh Meadow project of more than 3,000 apartment units in Queens, N. Y.; and a 150-apartment project at Princeton, N. J. Both will be garden type apartments.

ENGINEERS HONORED

Honorary membership in Tau Beta Pi, national honor association of engineers, has been conferred on Harold S. Ellington and Col. Herbert W. Alden of Detroit.

Mr. Ellington, a member of the firm of Harley, Ellington and Day, Inc., Architects and Engineers, is a member of the American Society of Civil Engineers and president of the Engineering Society of Detroit. Col. Alden, director of engineering and formerly chairman of the board of the Timken-Detroit Axle Company, is one of the founders of the Society of Automotive Engineers, and a fellow of the American Society of Mechanical Engineers.

MEETINGS ANNOUNCED

The summer convention of the American Society of Civil Engineers will be held at Spokane, Wash., July 17-20, and the fall meeting of the Society is scheduled for October 16–19 at Kansas City, Mo. Both meetings will feature technical sessions for the discussion of irrigation, power, hydraulics and other civil engineering matters.

PLANNING URGED

Advance planning of commercial and industrial construction, public works and other types of building currently restricted because of the need for channeling materials into veterans' housing should be encouraged by the federal government, according to A.I.A. president James R. Edmunds, Jr.

"If the planning for the post-emergency period were to be stopped by uncertainty," Mr. Edmunds points out, "there inevitably would be a serious bottleneck in the planning field as soon as the present restrictions on non-housing construction were lifted."

SWEET'S ARCHITECTURAL

Larger and more useful than ever before, the 1946 Sweet's File, Architectural, contains 924 manufacturers' catalogs totaling 7,268 catalog pages. Its comprehensive information on product forms, characteristics, performance and use stands in marked contrast with the encyclopedic type of information formerly offered by many of the firms.

Sweet's File, Architectural, is especially designed to meet the catalog needs of designers and constructors of buildings which are architect-planned and constructed under a general contract. It is distributed to active offices of

(Continued on page 136)

Know your
WIREMOLD

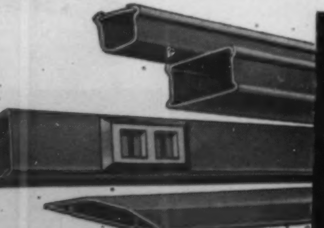
HOSPITAL WIRING PROBLEMS

find practical solution in WIREMOLD *products*

There are many places where Wiremold methods and equipment can contribute to efficiency in hospital design. Wiring for the nurse call and fire alarm systems, for example. Installations in leading hospitals throughout the country have proved the safety, convenience and economy of Wiremold signal system wiring in conjunction with modern call system equipment. Extension or relocation to meet all changing needs is provided for in advance. Simple standard fittings meet all installation requirements. Wiremold also offers you two basic PLUGMOLD, plug-in-anywhere convenience wiring systems for the kitchen, ward, service room, laboratory or operating room installation . . . and PANCAKE, the safe, trip-proof Overfloor Wiring when this type of installation is specified.

See the Wiremold Section in your current Sweet's File. Also write us for data sheets and bulletins.

THE WIREMOLD COMPANY, HARTFORD 10, CONN.



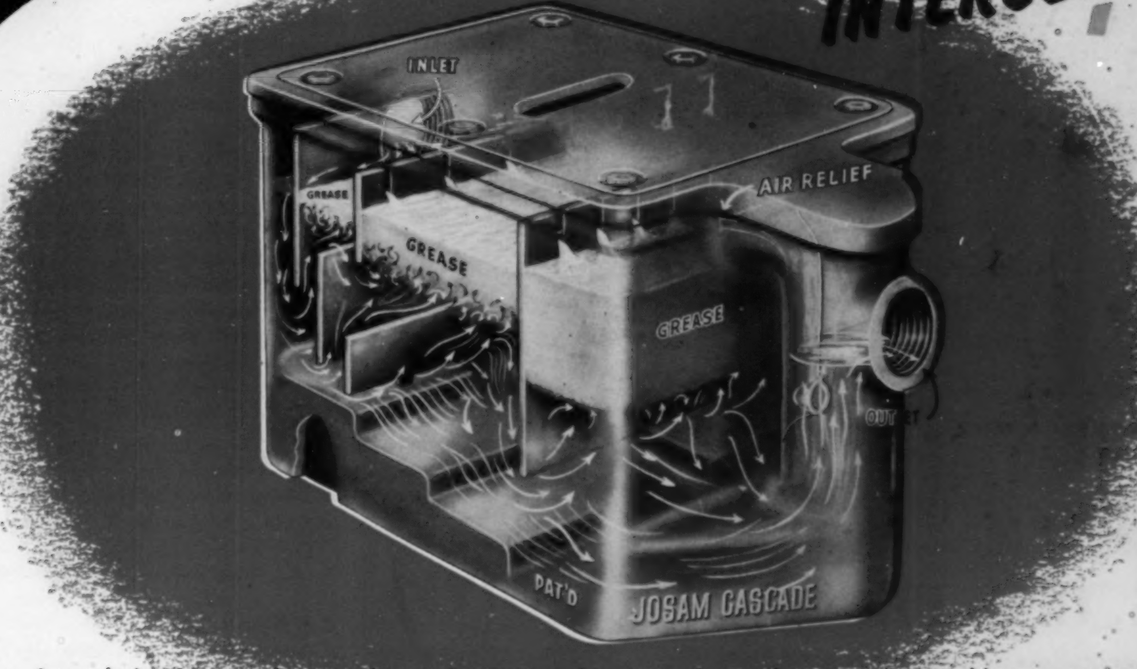
Know your
WIREMOLD
NEMA
.... MORE THAN ADEQUATE WIRING
FROM PANEL BOX TO OUTLETS

YOU CAN'T USE DYNAMITE TO CLEAR THE DRAINAGE SYSTEM WHEN *grease* FROM KITCHEN DISHES CHOKES UP THE PIPES

Wherever food is served, grease is an ever-present hazard. For when the grease from dishes, pots and pans is washed down the drains, it builds up layer upon layer on the inside of the drain lines until it eventually clogs up the pipes. When that occurs, you just can't "blow out" the grease. Kitchen service must be interrupted and repairs must be made which are costly and inconvenient. *The right time* to guard against this hazard is when specifications are being written . . . and *the right way* is to install exclusive Josam Cascade Grease Interceptors. Their cost is so little compared to the permanent trouble-free service they provide!

PLAN FOR *constant* ACTION

INSTALL THE *exclusive* Josam CASCADE GREASE INTERCEPTOR



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BOOKS WANTED

The American Book Center is collecting and shipping abroad scholarly books and periodicals which will be useful in economic, social and industrial rehabilitation of Europe and the Far East. Emphasis is placed upon publications issued during the past decade, and all subjects are wanted, especially those dealing with the sciences and technologies. Textbooks, recreational reading and popular magazines are *not* needed.

Shipments should be sent prepaid to The American Book Center, c/o the Library of Congress, Washington 25.

PUBLICATIONS NEEDED

"For a full six years of German occupation Czechoslovakia was deprived of source material on American science," writes Harry D. Gideonse, president of the Masaryk Institute. "Its libraries were destroyed and plundered by the Nazis.

"One of the gravest problems of its rebirth is this continued lack of information on the tremendous advance of research and practical achievements made in the United States. Urgent requests are reaching our Masaryk Institute, each of which stresses anew the pathetic need for this material.

"Upon the suggestion of our professional advisor, Robert H. Podzemny, member of The Architectural League of New York, we are turning to you for help in answering this call. Books and journals published since 1939 in the fields of architecture and engineering are most sorely needed. You might be able to spare them and thus help to cement the traditional friendship of our peoples and establish a lasting contact of our professions.

"All donated publications may be shipped in cartons, collect, to The Masaryk Institute, 8 W. 40th St., New York 18, N. Y. We pack them for overseas shipping to the National and Charles University Library in Prague, where an allocation committee distributes them to the proper institutions. Each book carries an *ex libris* with the name of the donor, thus placing on permanent record his personal share in this project of 'Science for Freedom.' "

PLANNERS ELECT

The officers elected at the recent annual meeting of the American Institute of Planners in Cleveland are: *board of governors*, Harold M. Lewis, New York City, Seward H. Mott, Washington, D. C., Paul Oppermann, Washington, D. C.; *secretary-treasurer*, John Nolen, Jr., Washington, D. C.; *vice-president*, Frederick J. Adams, Cambridge, Mass.; *president*, Earl O. Mills, St. Louis, Mo.

OFFICE NOTES

Offices Opened, Reopened

Clark & Enersen, Architects and Site Planners, have established an office at 1202 Sharp Bldg., Lincoln, Neb.

Eckbo, Royston & Williams have opened new offices at 121 Beale St., San Francisco 5, Calif.

Emile Gallet, Architect and artist designer, has resumed his designing free lance practice after three years with the Navy Department. Address, 120 W. 12th St., New York City.

Maj. William C. Halbert, Corps of Engineers, having been released from active duty, has reopened his office at 277 North Ave., New Rochelle, N. Y.,

(Continued on page 138)

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Kitchens of hotels, restaurants and institutions.
Photographic studios and zinc engraving plants.
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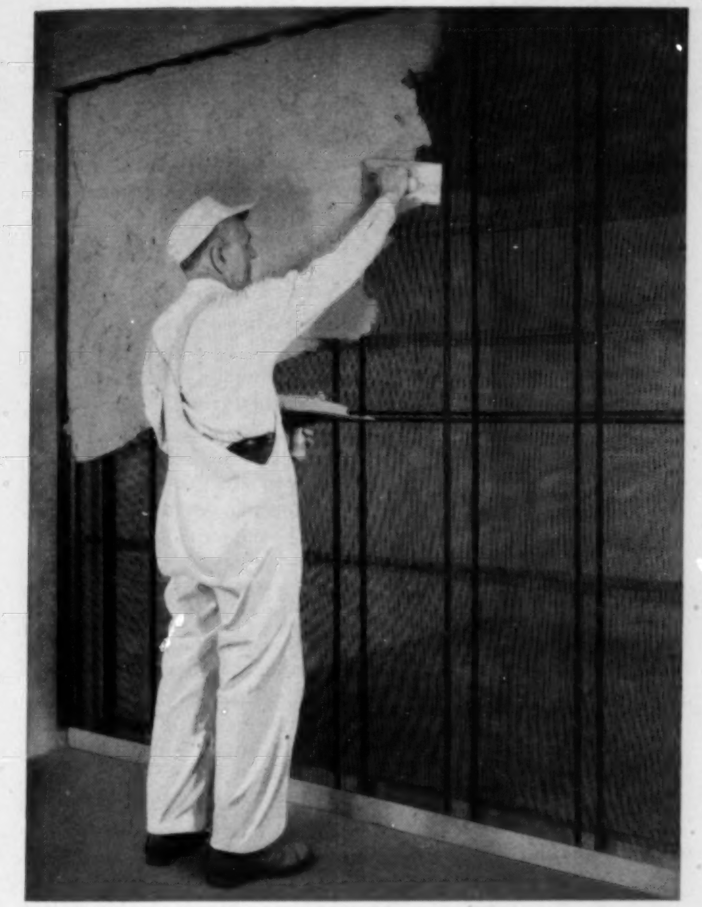

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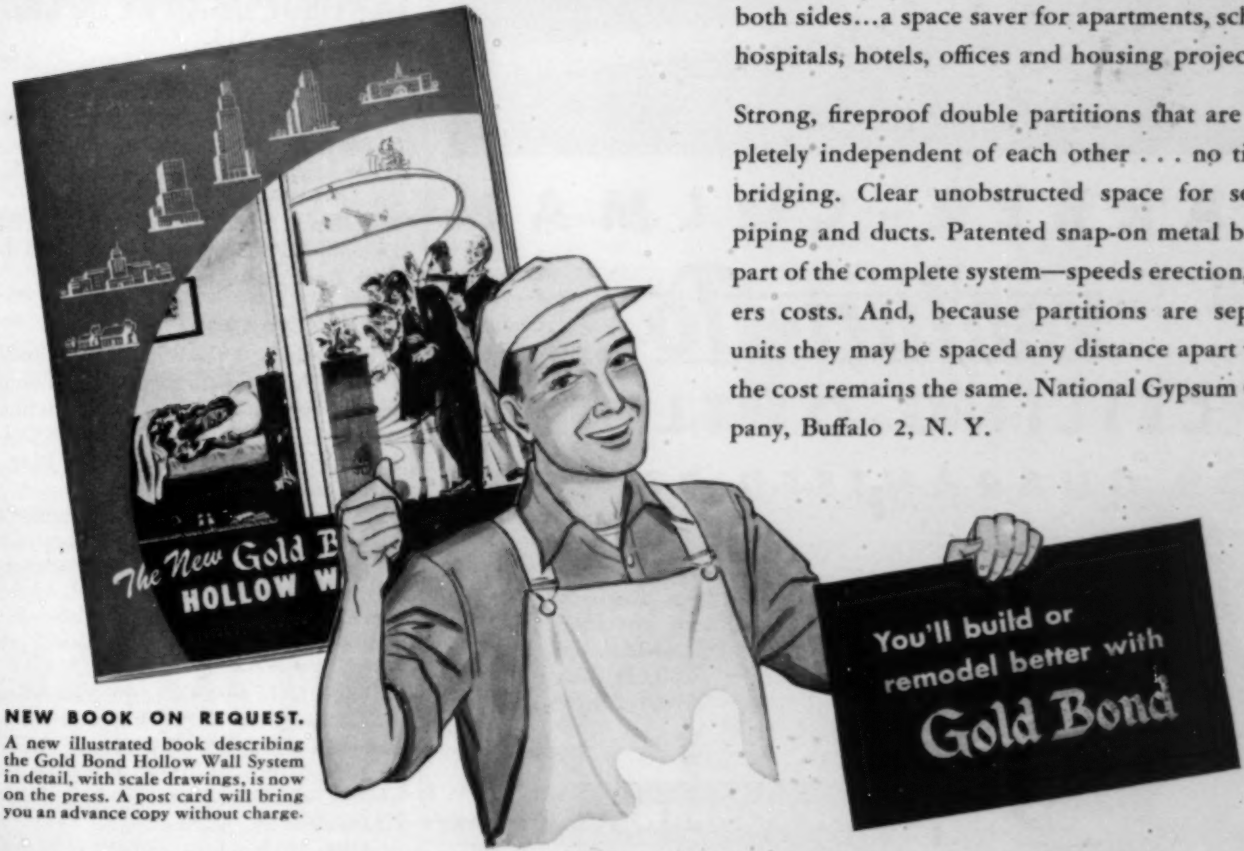
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THE RECORD REPORTS

(Continued from page 136)

under the name of William Carter Halbert, A.I.A., Architect.

Fred J. Hughes, Architect, has resumed practice at 1375 Euclid Ave., Cleveland, Ohio.

William Koblik, Architect and Associates, announce the opening of offices at 211 California Fruit Bldg., Sacramento 14, Calif.

Angus McSweeney, Architect, has resumed practice and has opened new offices at 514 Mission St., San Francisco 5, Calif.

Albert Melniker, Architect, recently returned from duty with the Corps of Engineers, AUS, has reopened his office at 130 Bay St., Staten Island, N. Y.

William Muschenheim, Architect, has announced reopening of his office at 230 W. 13th St., New York 11, N. Y.

Roth & Rausch, Architects, have opened offices at 120 N. Broadway, St. Louis 2, Mo.

Runyan & Slee (Damon O. Runyan and Angus E. Slee), Engineers, have reopened their office in Longmont, Colo., following their discharge from the Armed Forces.

E. Allan Sheet, Architect, has resumed his practice with temporary offices at 327 North Western Ave., Los Angeles 4, Calif., pending locating permanently in Beverly Hills.

Paul M. Speake, Architect, having returned from service with the Navy, has reopened his office at a temporary location in the Old Post Office Bldg., Huntsville, Ala.

New Addresses

The following new addresses have been announced:

Asbestos Cement Products Assn., Commercial Trust Bldg., Room 1736, Philadelphia 2, Pa.

Robert M. Becker, Structural Engineer, 50 Beacon St., Boston 8, Mass.

J. Lloyd Conrich, Architect, 593 Market St., San Francisco 5, Calif.

C. Howard Crane, Architects and Engineers, 7, Buckingham Gate, London, S.W.1, England.

J. di Cristina & Son, Wood Products and Stair Builders, 350 Treat Ave., San Francisco 10, Calif.

Eugene Henry Klaber, F.A.I.A., A.I.P., Housing and Town Planning Consultant, 56 W. 45th St., New York 19, N. Y.

Paul A. Marzillier, Architect and Engineer, and Ernest Weyland, Architect, 633 N. Water St., Milwaukee 2, Wis.

Thomas Henry Moran, Architect, Hillcrest Estates, Jefferson Rd. and Route 31, Princeton, N. J.

C. Godfrey Poggi, Architect, 621 Newark Ave., Elizabeth, N. J.

Whitney R. Smith, Architect, 204 South Los Robles, Pasadena 5, Calif.

Sebastian J. Tauriello, A.I.A., A.D.I., 296 Delaware Ave., Buffalo 2, N. Y.

Walter Dorwin Teague, Industrial Designer, West Coast offices, 3142 Wilshire Blvd., Los Angeles 5, Calif.

Firm Changes

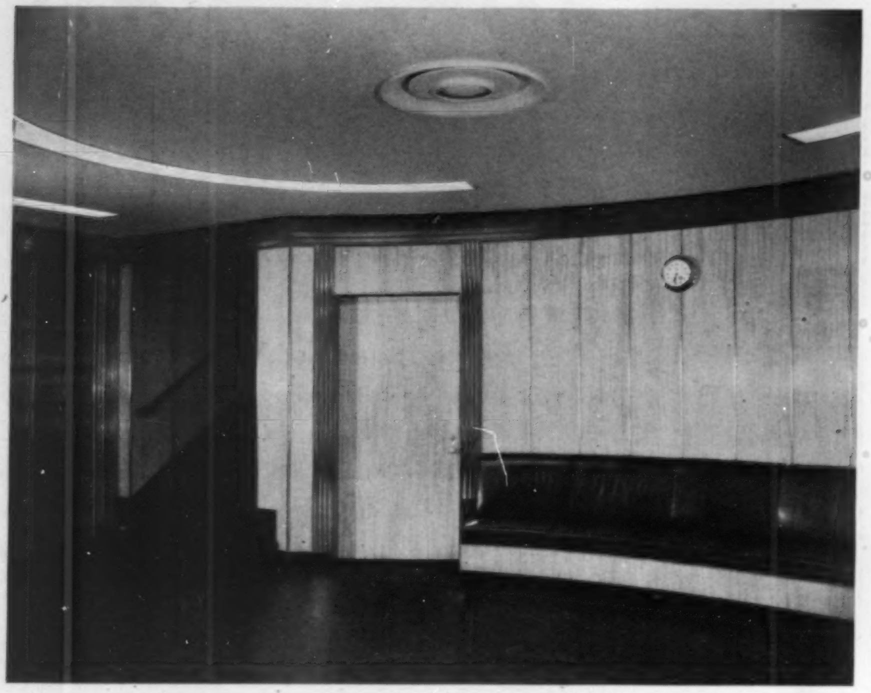
Kenneth W. Dalzell and K. Whitney Dalzell, Jr., have formed a partnership for the general practice of architecture under the firm name of Dalzell & Dalzell, Architects. Address, Dalzell Bldg., Millburn Ave., Short Hills, N. J.

Huson Jackson and John Hancock Callender announce the formation of a partnership for the practice of architecture, design and housing research, under the firm name of Jackson and Callender. Address, 299 Madison Ave., New York 17, N. Y.

Willis Irvin announces the association of his daughter, Helen Stuart Irvin, as member of the firm Willis Irvin, Architect, Helen Stuart Irvin, Associate Architect, with offices in their own building, 722 Greene St., Augusta, Ga.

John M. Kokkins and A. C. Lyras

(Continued on page 140)



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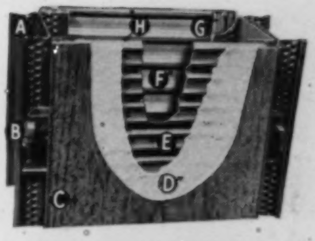

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have formed a partnership for the general practice of architecture under the name of Kokkins & Lyras, Architects, with offices at 4–6 Platt St., New York 7, N. Y.

Norman Lederer and Leonard Joseph, Architects, have announced formation of a partnership for the general practice of architecture. Address, 37 W. 57th St., New York 19, N. Y.

Reginald E. Marsh has announced his withdrawal from, and the consequent dissolution of, the firm of Tooker & Marsh, Architects. Mr. Marsh is now associate architect with the firm of Starrett & Van Vleck, with a branch office at 101 Park Ave., New York 17, N. Y.

Ray Rich, USNR, has been named a full partner in the firm of Van Doren, Nowland & Schladermundt, Industrial Designers, of New York and Philadelphia.

D. Kenneth Sargent, Frederick S. Webster, Thomas T. Crenshaw and Milo D. Folley have formed a partnership for the general practice of architecture under the firm name of Sargent, Webster, Crenshaw and Folley, Architects. Address, Syracuse Kemper Bldg., Syracuse 2, N. Y., and Watertown Natl. Bank Bldg., Watertown, N. Y.

John Y. Sloan, Architect, John A. Beane and Warren H. Thompson, Consulting Engineers, have announced formation of a partnership and the removal of their offices from 296 Delaware Ave. to 775 Main St., Buffalo 3, N. Y.

Charles E. Thomas has announced a partnership with Gordon Sweet for the practice of architecture under the firm name of Thomas and Sweet, Architects, with offices at 224 Colorado Springs Natl. Bank Bldg., Colorado Springs, Colo.

Kenneth L. Trumble, recently returned from the Pacific, is now an associate in the office of Charles F. Obenback, A.I.A., 505–506 Elderfield & Hartshorn Bldg., Niagara Falls, N. Y.

Lam Woo, Architect, following four years of service in the European theater, is now a draftsman in the university architect's offices of Ohio State University, of which he is an alumnus.

APPOINTMENTS

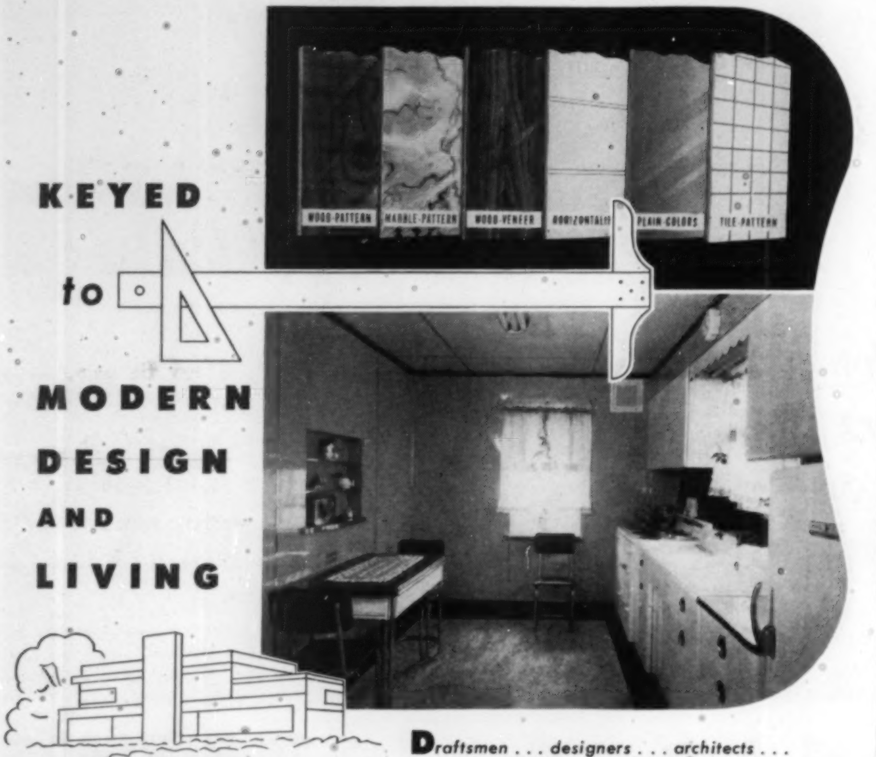
Harold Bush-Brown, A.I.A., professor and head of the department of architecture, Georgia School of Technology, has been appointed to the Board of Advisory Architects of the American Commission for Living War Memorials. He succeeds the late William J. Sayward, F.A.I.A., of Atlanta.

Robert B. Jacoby has been appointed deputy governor of the Federal Home Loan Bank System, with which he has been associated for the past 13 years.

The appointment of Capt. E. A. Verpillot, USNR, of New York City, as Deputy Expediter in charge of the Office of Production and Supply, has been announced by Housing Expediter Wilson W. Wyatt. Capt. Verpillot will work closely with Rear Admiral Kirby Smith, USNR, and in general will have charge of the production end of the Veterans Emergency Housing Program. Under him will be the technical research, prefabrication production, construction, materials, and labor relations branches of the organization.

A CORRECTION

The up-state New York school project presented on page 110 of the March RECORD and on pages 72–81 of the April issue was credited incorrectly to Perkins and Will, Architects and Engineers, in March, and to Kaelber and Waasdorp, Wheeler and Will, Associated Architects, in April. The school is the work of Kaelber and Waasdorp, Architects, Perkins and Will, Architects-Engineers, and should have been so credited in both issues.



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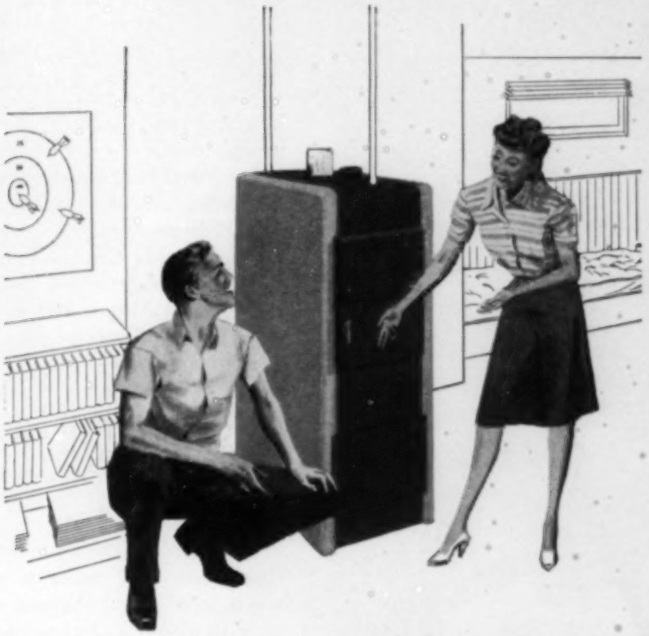

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A.I.A. CONVENES AT MIAMI BEACH

Architects from all over the country journeyed by plane, car or train to Miami Beach for the A.I.A.'s first postwar convention, May 8, 9, and 10. This 78th Annual Convention found some five or six hundred architects and many wives in attendance, the largest registration recorded at any convention in the Institute's history.

From almost any point of view, the week was a great success. The strain of war was gone, and the strain of reconversion and government regulation was not enough to dampen the architects' spirits or their enthusiasm for the airing of grievances. Many of the old guard were on hand, and on the other hand, many delegates were attending their first convention. There should be a rule that of every two delegates one must be under forty, and each pair should be accompanied by a junior associate or student member.

The fact that there was not one hotel large enough to accommodate the entire group, detracted but little from the unity, but it did make for some difficulty in finding friends and cohorts for informal discussions.

An informal discussion of the program by members of the convention committee. Left to right: Robert M. Little, president, South Florida chapter; John L. Skinner, South Atlantic director; Russell T. Pancoast; William E. Tschumy; Igor B. Polevitsky, general chairman of the committee; and Donald G. Smith

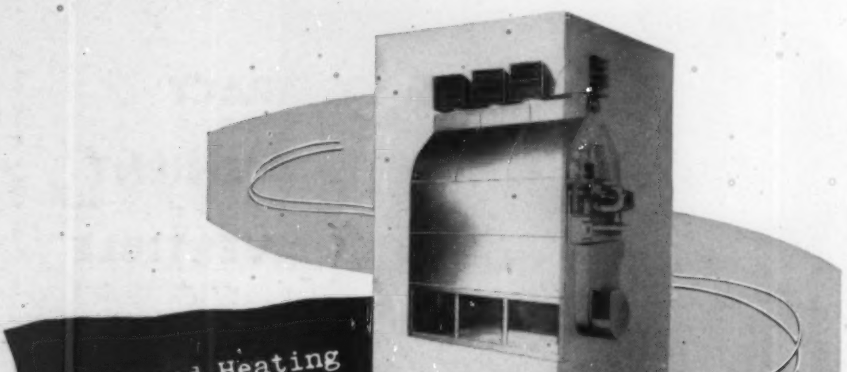
The Florida Chapters had arranged interesting sightseeing tours. A boat trip around Miami and Biscayne Bay, with fleeting views of luxurious winter homes, and a day's jaunt to Boca Raton and Palm Beach were most enjoyable. To top it all off, over a hundred architects took advantage of the air tour to Havana, with all its old-world atmosphere and picturesque Spanish architecture.

Sessions of the Convention itself were conducted in a healthy and friendly spirit, and formal business was disposed of with dispatch. Urban planning, "Rebuilding America," was discussed from various points of view by Sumner Spaulding, Jerrold Loebl, Henry Churchill, Louis Justement, Howard K. Menhinick, and Tyler S. Rogers. Carlos Contreras of Mexico City brought word of urban planning developments from our southern neighbor. The attack and defense of the city of Chicago enlivened the proceedings.

An afternoon of round table discussions was full of interest. Four separate round tables were conducted simultaneously — the one on schools by Charles T. Ingham and Kenneth C. Welch; on hospitals by Marshall Shaffer and Charles H. McCauley; on housing by Louis Justement and Henry Churchill; the one on the meaning of design by Ralph Walker and Edwin B. Morris.

A most interesting "open session" of the Board of Directors was held one evening to give any and all members and delegates a chance to make suggestions, to air grievances, and to speak their minds. The President's Reception was a gala occasion held around an outdoor swimming pool.

(*Continued on page 144*)



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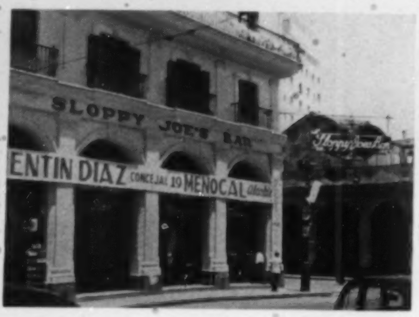
A.I.A. CONVENES

(*Continued from page 142*)



One of the popular meeting places in Havana for extra-convention gatherings

At the Annual Dinner, the Gold Medal of the Institute was awarded posthumously to Louis Henri Sullivan. The letter of acceptance from George G. Elmslie was read by Paul Gerhardt, Jr. Fellowships were conferred on Louis Justement of Washington, D. C., Samuel A. Marx of Chicago, Talmage C. Hughes of Detroit, G. Edwin Brumbaugh of Philadelphia, Frank E. Cleveland of Boston, D. K. Este Fisher, Jr. of Baltimore, and Henry E. Gutterson of North California.

With much wit and wisdom, Roger Allen of Grand Rapids acted as toastmaster in his usual masterly fashion. Philip M. Klutznick of the Federal Public Housing Authority was the serious speaker of the occasion.

Most vociferously debated business to come before the Convention was the attitude of the Institute toward the qualified architects' list of the American Hospital Association (See AR 12/45, p. 79). Pros and cons were expressed with feeling. A roll call supported a resolution: "*Resolved*, That the A.I.A. in convention assembled instructs The Board of Directors to disapprove the nominations of A.I.A. members for the examining board of A.H.A. together with any suggestions of approval thereof, understood or implied, and that the A.I.A. respectfully advises the A.H.A. that it looks upon any specialized list as undemocratic in principle and contrary to ethical practice."

Other resolutions adopted a new administration organization structure for the Institute, furthered the unification of the profession, urged the redrafting of the Wagner-Ellender-Taft Bill, approved of the Senate Bill 191 (hospital survey), expressed thanks to the architects of Florida for their hospitality, and approved of most of the other sections of the report of the Board of Directors.

Much of the value of any Convention is the contact of mind with mind and the exchange of ideas in informal conversation. The Miami Convention was no exception, and the bathing beaches, terraces, and tours enhanced the convivial and friendly spirit.

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In selecting equipment for the Hotel Bellerive in 1922, Architect Preston J. Bradshaw, of St. Louis, sought long life and low maintenance cost. He specified Webster Sylphon Traps for installation on 605 radiators.

For 23 years, heating comfort was unimpaired and this building required only 24 new radiator trap interiors — one per year.

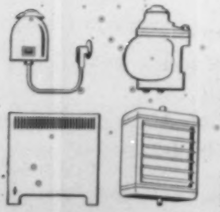
During the 1944-45 heating season a complete check-up and overhaul of all traps was begun by the Hotel Bellerive. Replacement of worn interiors with Webster Sylphon Attachments with new bellows and stainless steel valve piece and insert seat gives the hotel a better trap than the original.

Of course, this service record of Webster Equipment would not have been achieved without conscientious operation of the heating system at proper low pressures and competent supervision by the rental company. Proper selection of heating equipment *and proper use* — these are both essentials of heating economy.

Planning a 194? Hotel Bellerive?

In 1922, the logical choice was a Webster Vacuum System with Webster Traps on radiators and drip points.

Today the choice would be a Webster Moderator System with:



Webster Outdoor Thermostat;

Webster System Radiation—concealed convectors with *integral* Webster Traps and Valves;

Webster Drip Traps;

Webster-Nesbitt Unit Heaters.

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WARREN WEBSTER & CO., Camden, N. J.
Representatives in principal U. S. Cities : : Est. 1888
In Canada: Darling Brothers, Limited, Montreal

Webster
Heating Systems

(Continued from page 116)

lumination and the history of the subject organization in the production of lighting fixtures. Many of the period and modern designs created by them are shown in the settings for which they were designed. Tabulation of special lighting jobs for various types of buildings. 24 pp., illus. Edwd. F. Caldwell & Co., Inc., 101 Park Ave., New York 17.

PARTITIONS

The Gold Bond 2-inch Solid Partition System. Features and details of the solid gypsum wall system are discussed. Tables show comparative costs of various types of wall construction. Specifications, construction methods, and complete erection detail drawings. 16 pp., illus. National Gypsum Co., Buffalo 2, N. Y.*

PROJECTION EQUIPMENT

Planning the Projection Room. A concise study of the principles of talking picture projection room design, with additional consideration of the rewind room, the power equipment room and lavatory. Construction, soundproofing, lighting and ventilation requirements are covered. Detail drawings of wiring, ductwork, porthole shutters and sound system. Table gives method of determining location of projection port. Chart for selection of proper screen size. Photographs and detail drawings of equipment: projectors, transverters and rectifiers, including dimensions. 36 pp., illus. National Theater Supply Co., 92 Gold St., New York, N. Y.

PUMPS

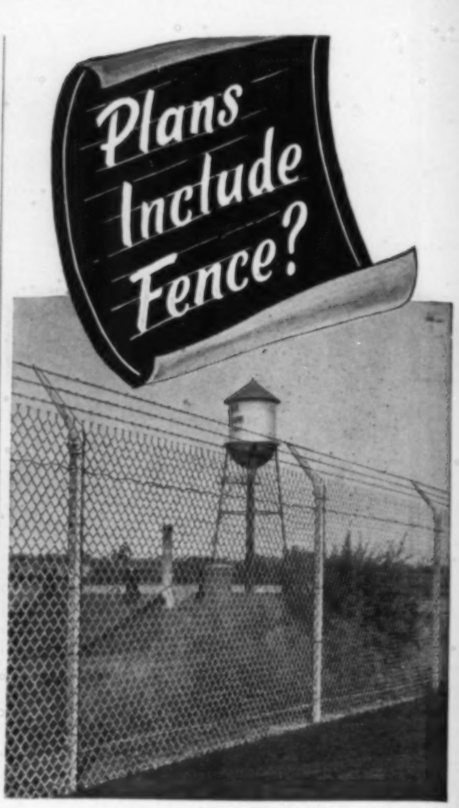
Horizontal and Vertical Axial Flow — Catalog No. G845. Large capacity pumps suitable for flood control projects, drainage, irrigation, dewatering, and condenser circulation are described and illustrated. Construction and operation are outlined, together with many detail drawings and sections. Typical installations for various purposes in industry, power plants and central heating systems. Tables for pump selection according to required volume flow and water head. 16 pp., illus. Economy Pumps, Inc., Hamilton, Ohio.*

ROLLING DOORS

Kennatrack. Folder describes track and wheeled carrier for hanging single and parallel sliding doors. Method of installation, sections and details. 4 pp., illus. Jay G. McKenna, Inc., Elkhart, Ind.

Kinnear Rolling Doors. Catalog of steel rolling service doors, steel fire doors and window shutters, sectional overhead

(Continued on page 148)



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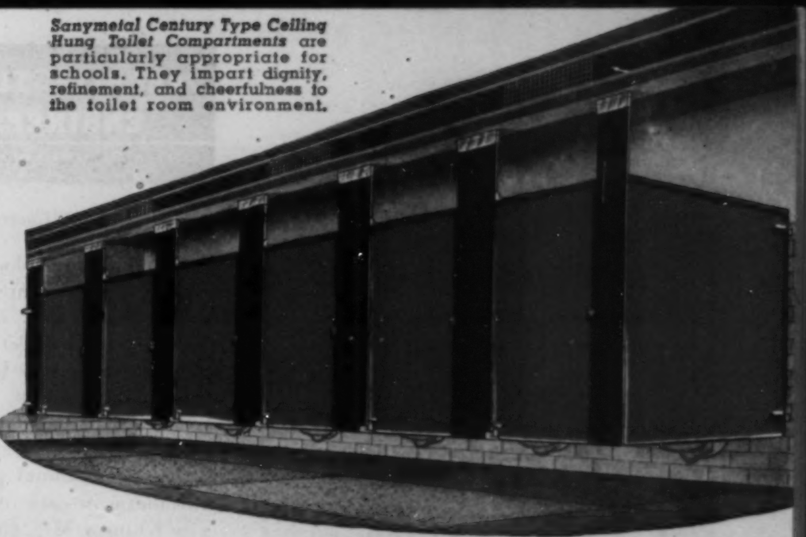
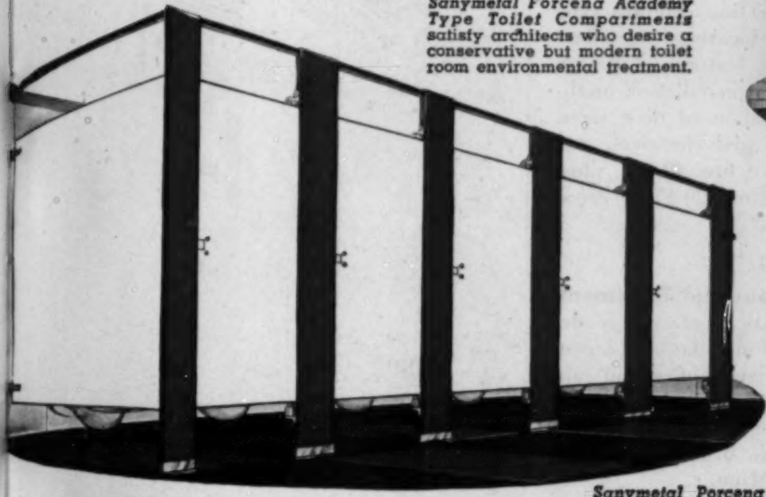
TOILET COMPARTMENTS

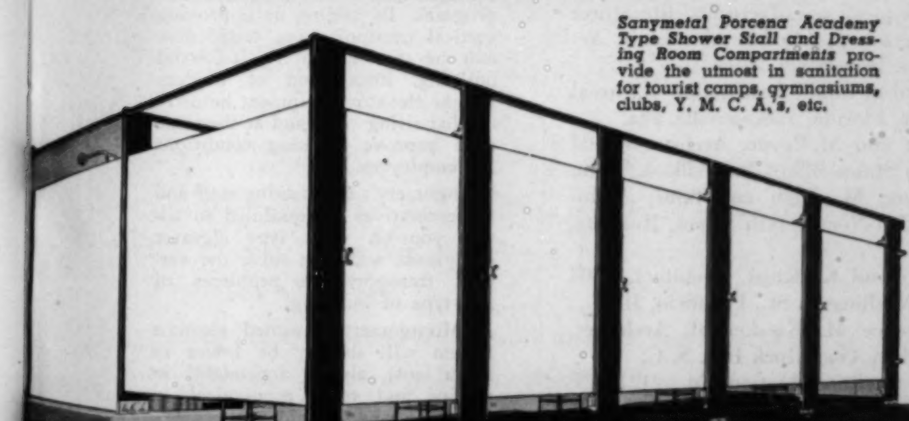


Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.



Sanymetal Porcena Academy Type Toilet Compartments satisfy architects who desire a conservative but modern toilet room environmental treatment.

Sanymetal Porcena Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements.



Sanymetal Porcena Academy Type Shower Stall and Dressing Room Compartments provide the utmost in sanitation for tourist camps, gymnasiums, clubs, Y. M. C. A.'s, etc.

● Toilet compartments usually dominate a toilet room, influencing the environment of a room which is important to everyone occupying the building. The easy way to have clean, inviting, colorful and sanitary toilet facilities is to install Sanymetal "Porcena" (Porcelain on Steel) Toilet Compartments.

"Porcena" (porcelain on steel) combines the hardness of glass with the strength of steel, thus providing a material that is ideal for toilet and shower compartments. Rust-proof, impervious to moisture, odors, ordinary acids, smoke, oils and grease, "Porcena" Toilet Compartments come in never-fade colors imbedded deep into a flint-hard surface that (1) discourages pencil marks, scratches and washroom art, (2) is easy and quick to clean, and (3) eliminates expensive periodic repainting and repairs.

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Sanymetal Catalog 84 illustrates several typical toilet room environments.

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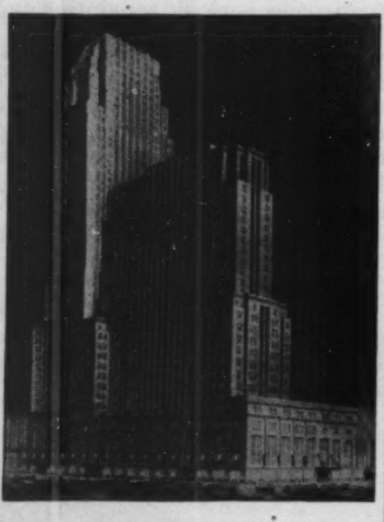

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(*Continued from page 146*)

doors, bifolding doors, rolling metal grilles, airplane hangar doors, vertical sliding doors and other special type doors. Discusses selection of proper type of door for various locations. Specifications, construction features, full size sections of members, installation methods and details. Tables of door sizes. Operation, manual and electrical, and automatic in case of fire. 40 pp., illus. The Kinnear Mfg. Co., 820 Fields Ave., Columbus 16, Ohio.*

SOUNDPROOFING

Vercoustic Acoustical Treatment. The use of acoustical plaster is described and several installations shown. Table lists coefficients of sound absorption at various frequencies. Specifications for mixing, application and painting. 4 pp., illus. B. F. Nelson Mfg. Co., Minneapolis, Minn.

STAINLESS STEEL

Hospital Equipment of Enduro Stainless Steel. Many applications of stainless steel to counters, shelves, tables, cabinets, rails, doors, sinks, and other specialized installations and equipment in hospitals are described and illustrated. Further possibilities of architectural use of stainless steel are discussed. Data table shows corrosive effect of various chemicals commonly used in hospitals. 24 pp., illus. Republic Steel Corp., Cleveland 1, Ohio.*

• LITERATURE REQUESTED

The following architects and organizations request manufacturers' literature:

Anderson & Mower, Associates, Architects, Iron River, Mich.

Board of Public Instruction of Duval County, Florida, Jacksonville, Fla.

Hart and McBryde, Architects, 407 Cotton States Bldg., Nashville 3, Tenn.

Wayne M. High and Sons, Architects, 230 North Sixth Street, Reading, Pa.

Raymond K. Knox, Architect, 1005 East Washington St., Pittsfield, Ill.

Clarence M. Kuykendal, Architect, 524 Aiken Ave., Rock Hill, S. C.

Liberal Reproduction Co., 212½ N. Kansas, Liberal, Kans.

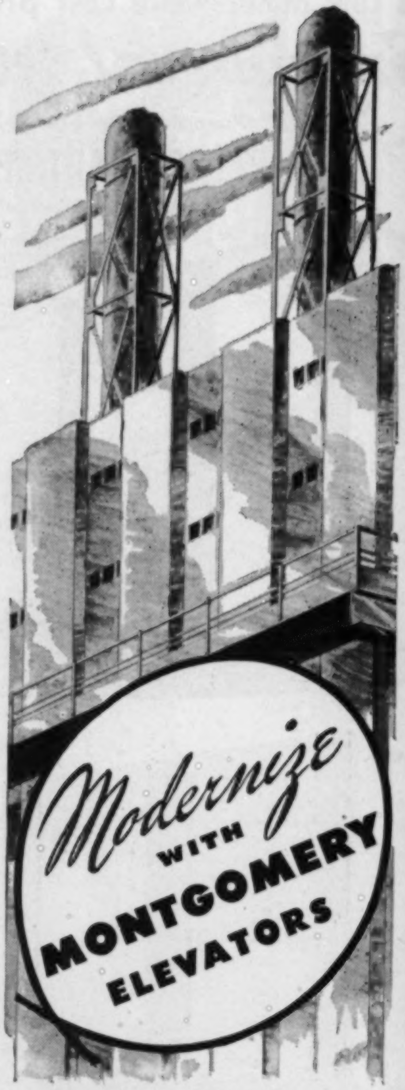
Homer B. Scott, Architectural Engr., 667 Barnett St., NE, Atlanta, Ga.

C. W. Shaver, Jr., Architect, 22 So. Main, Sheridan, Wyo.

T. Richard Shoaff, Architect, W. Byron Proctor, Associate, 406 W. Berry St., Fort Wayne 2, Ind.

Joseph W. Stephenson, Landscape Designer, 920 A St., Hayward, Cal.

Veterans Administration Construction Service, Branch Office No. 4, 900 North Lombardy St., Richmond, Va.



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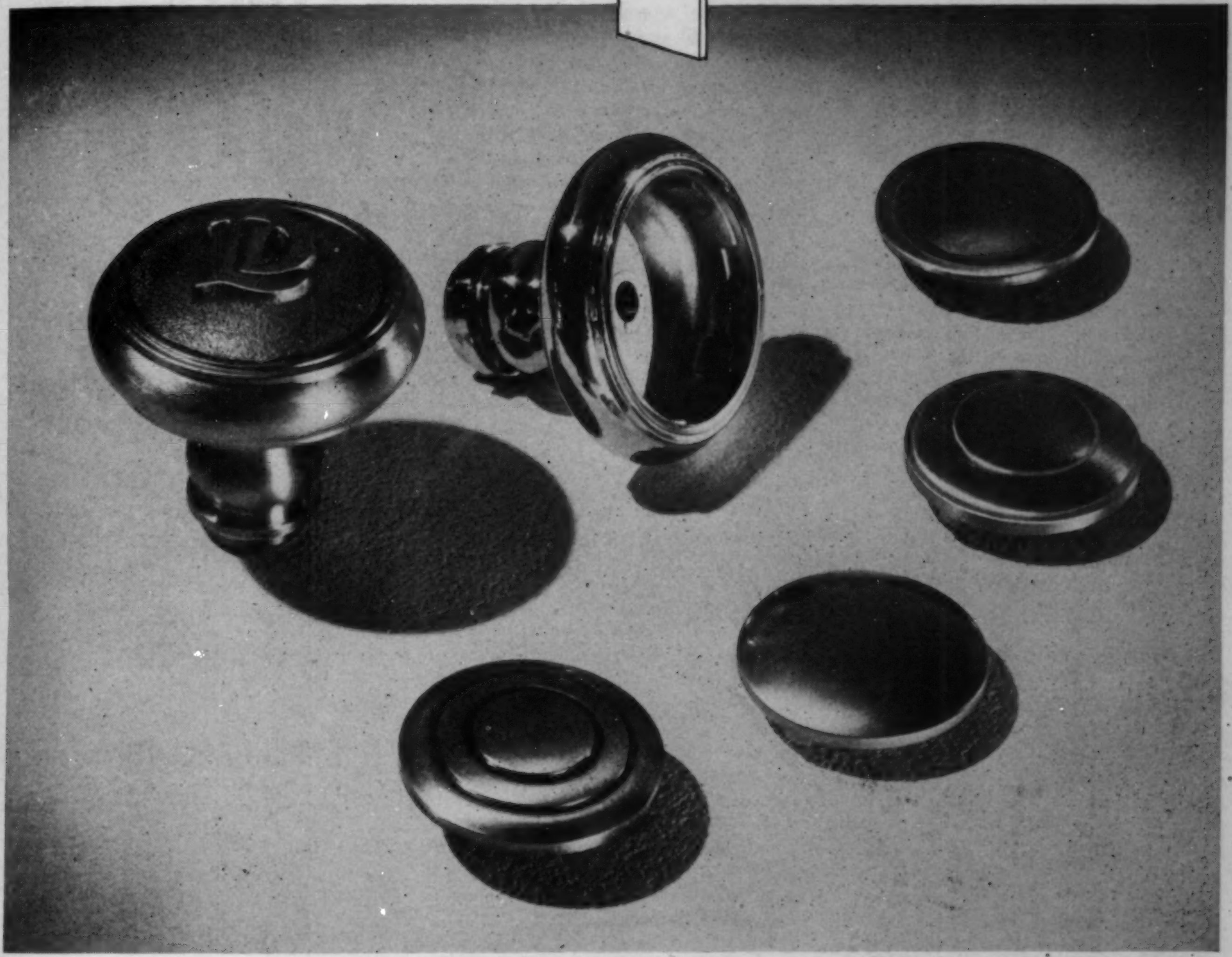

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